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ABSTRACT

Upper division undergraduate students at the University of California at Berkeley were surveyed to obtain evaluations of life science-related departments and programs. Of 1,472 questionnaires mailed out, 798 were returned. The questionnaire dealt with such matters as general education requirements, the quality of lower division education, extent of student contact with faculty, advising, coursework, overall student satisfaction and impact of the educational process, and students' views on various educational and university policy questions. Questions about curricula concerned the structure of the major, coverage of content, interpretation of content, class size, scheduling, competition, workload, grading, and testing. Questions about the faculty concerned their ethnicity and sex, informal relations with students, and the faculty's receptivity to males, females, whites, and minorities. A large majority of the students agreed that their program should facilitate undergraduate organization by including students on most committees, providing office space, and by similar types of inclusion. Lectures and coursework in most of the majors were evaluated as being interesting and challenging by very large majorities, and a plurality saw most faculty as being receptive to student input on class structure and content. Information and advising staff were seen as "generally quite helpful." Recommendations and information on demographic characteristics of respondents are presented. (SW)

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An Academic Review Using Comparative Student Evaluations of the LIFE SCIENCE-RELATED DEPARTMENTS AND PROGRAMS AT BERKELEY

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compiled by
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The work of the two ARU research assistants, Andy Hanami and Carol Brewer, as well as a number of volunteers, was vital to the successful completion of the medium-scale survey evaluation project which provided the data for this review. The project involved students in more than 25 programs and departments. Over 1500 questionnaires were sent out; over 800 were returned. Data obtained here will enable the ARU to demonstrate the value and necessity in the academic review process of the collection and comparative use, across departments and programs, of student evaluations of their programs.

Funding

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*See also the 1976-77 ARU reports on the pre-health sciences, the History of Art Department, the undergraduate Spanish major, and on 8 undergraduate programs in the Humanities.

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SUMMARY OF FINDINGS[1]

CURRICULUM

Structure of the Major. With the possible exception of a few programs, the structure of the major — number of prerequisites,** number of required courses,** and options available within the major* — was generally seen as satisfactory by the students surveyed.

Coverage of Content. The adequacy of coverage of the subject matter was a source of very few problems for students. Advanced courses were available in most students' interest areas;** coursework for the major was quite well-integrated from course to course;** training in methodology was regarded as very up-to-date** and with some exceptions gave enough experience in real problem-solving;** there was very little waste of classtime on students with inadequate background preparation.* A majority of the respondents agreed on the availability of enough academic-experiential learning opportunities (fieldwork, internships, labs, credit for appropriate volunteer experience).

Equipment or supplies were generally seen as adequate.**

Interpretation of Content. Only a modest proportion (39%) of these students in the life-related sciences recognized the applicability of, or could evaluate their program's courses on their coverage of perspectives of the nondominant "schools of thought," and most of these students thought the coverage insufficient. Despite some exceptions, however, program faculty were usually rated as showing enough concern about social issues in teaching their courses.**

Class Size, Scheduling. A large plurality of the respondents disagreed that "large lecture classes can generally provide adequate learning opportunities" in their field.** However, they also indicated generally that there are not enough small seminars.** The scheduling/availability of courses was a problem for almost as many students as not.**

Competition, Workload, Grading, Testing. A large plurality of the students disagreed that they "study and learn best in an environment with competition at a level such as we have here at Berkeley." Whether faculty were clear about course goals and what students need to know or do to get an "A" grade received a split response.** Tests in most courses were usually seen as measuring students' knowledge of the subject matter fairly accurately.* Although there were differences between program ratings, substantial majorities felt that grading was more rigorous** and workload per unit was heavier** in their own program.

TEACHING

Lectures and coursework in the various majors were evaluated as being interesting and challenging by very large majorities. Nearly the same

*/**See text and tables for differences between program ratings. (* = differences at or below .05 probability; ** = at or below .01.)

[1]The choice of words in this summary is based on three response categories: agree, in between, and disagree. (See "Reporting the Data.")

size majority disagreed that T.A.s are either poorly chosen or poorly trained and supervised.* A plurality of the respondents also agreed that comments or review of papers, problem sets, exams, etc. were thorough enough.* And a plurality saw most faculty as being receptive to student input on class structure and content.**

Learning. A solid majority agreed that they would remember for a long time to come what they learned in their program's courses.* And students were generally impressed with the caliber or motivation of their fellow majors.

FACULTY

Sex and Ethnicity. In only four programs did students view the number of women faculty as sufficient; in all others, a clear shortage was perceived.** Agreement was even more definite that there were not enough faculty of ethnic minority origins.

Informal Relations with Students. A plurality of students disagreed that their faculty aren't really interested in or concerned about undergraduates** and agreed that communication between faculty and students is "open and fairly extensive."** Further explanation or extra instruction in the subject matter, or a referral for help, was usually easy to obtain. Getting at least one good letter of recommendation from a faculty member in their program was more problematic. Students were also split rather evenly concerning whether they trusted faculty to take student needs and views into account in program decision-making.**

INFORMATION AND ADVISING SYSTEMS

Program office staff were seen as "generally quite helpful" throughout the sample.* Orientation for students new to the major was of mixed effectiveness.

Advising information was seen by a plurality of the students as making it easy to choose courses and professors.* Agreement generally equalled disagreement concerning the sufficiency of information about graduate and professional schools. A majority of respondents felt there was not enough information about career t career opportunities for Bachelor's degree recipients.**

Choice of Faculty Advisors. A very large majority of the respondents felt that it would be (or is) valuable to have a regular faculty advisor of their choice,** but a substantial majority disagreed that they had a faculty advisor of choice.**

STUDENT PARTICIPATION

A rather large majority of the students surveyed agreed that their program should facilitate undergraduate organization by including undergraduates on most committees, providing office space, allowing a quarterly mailing, etc. About half of the sample had been notified of a meeting of a general undergraduate organization in their program, and about half had not.** Very few students responding had in any real way been active or consulted for student input by their program** and even fewer claimed any real knowledge about decision-making processes, policies or program governance.**

Teaching Evaluation. Students reported that a form for student evaluation of teaching was distributed in practically every class. They also rather strongly agreed that faculty should occasionally use the ASUC Primer questionnaire in their large or required courses, so that students will have access to evaluations of faculty teaching.

OVERALL SATISFACTION

Overall levels of satisfaction with the various programs were moderately high, with some exceptions.**

STUDENTS' GOALS AND THE PROGRAM'S CONTRIBUTION THERETO

The five goals presented to students on the questionnaire were all of quite high importance. Training in critical thinking and analysis, career preparation,* and preparation for graduate or professional school were of somewhat greater importance, however, than obtaining a broad, general, humanistic, or person-centered education,* or promoting social responsibility and developing skills useful in the community.**

Majorities saw their program's contribution to these goals as high in regard to preparation for graduate or professional school** and training in critical thinking.** A small plurality viewed the contribution to career preparation as high (rather than "in between" or low).** A plurality, and a large plurality, respectively, thought their program's contribution was low to a broadly humanistic education** and to social responsibility/community skills.**

The differences between the average "importance" and "contribution" ratings were large for social responsibility/community skills, a broadly humanistic education, and career preparation, and modest with respect to critical thinking and preparation for graduate or professional school.

RECOMMENDATIONS

I. PROCEDURAL

A. Departments and Programs. All departments and programs evaluated in this report (see page 8) should review the text and tables carefully* to ascertain the following:

1. Where their students' ratings indicate that they are relatively less effective than other departments and programs.**
2. Where their students rate them relatively well, but where most programs appear to need improvement.

*Please remember that the ratings, whether as proportions of the respondents or as means, are imprecise but also represent a "best estimate."

**Programs which enroll a large number of pre-health science students should also review the full ARU report on the pre-health sciences.

3. Where students' ratings indicate a relatively high performance (in order to help other programs).

B. Campus, Senate and College Authorities. Some of the recommendations following need effective review, support, monitoring, and implementation by such administrative and Senate agencies and individuals as the Council on Educational Development, the Committees on Educational Policy and Budget and Interdepartmental Relations, the Executive Committee of the College of Letters and Science, department chairpersons, deans, provosts, the Associate Vice Chancellor for Academic Development, and The Vice Chancellor.

II. TOPICAL

A. Advising. In assessing and proposing faculty workloads at the departmental level for review by the Budget Committee and the Administration (as recommended by the Academic Assembly*), departments should formally allocate some faculty time to undergraduate advising, expecting other duties instead for those faculty members who do not serve as undergraduate advisors.

A committee of faculty, students and appropriate program staff should be formed to improve orientation and advising of various types (career, graduate-professional school, course-professor selection), and to prepare and make provision to update informational handouts as needed by/for students.

In all programs except (perhaps) the most seriously overenrolled/underfacultied, students should be assigned to (and be free to change) faculty advisors. In seriously overenrolled/underfacultied programs, the Administration should provide at least enough temporary faculty or staff resources to enable informational advising functions to be maintained at an especially effective level.

B. Competition and Grading. The campus should move to reduce competition among students by adopting clear and reasonable standards of knowledge and understanding for all coursework, and these expectations should be enunciated at the first meeting of classes. The "average" student at Berkeley is a good student; he or she should be expected to earn an average grade of "B," which is defined in the Manual of the Academic Senate [p. 18] as representing "good" work (as contrasted with "fair" or "excellent"). Standards of quality may rise generally, as advances are made in prior preparation of students, integration of subject matter, and consciousness, but expectations for purposes of grading in "hard" content courses should be based on general competencies, rather than on purely relative performance, breaks in the distribution of points earned, quarter by quarter variation, or emphasis on soon-forgotten details.

Where grading and learning standards are reasonable and clear, and not immediately affected by the performance of other students in a class, the student will be more likely to be rewarded for and more likely to undertake a reasonable workload, and more likely to retain information thus assimilated. Additionally, the development of effective modes of learning which involve cooperation between students should be emphasized.

*Record of the Assembly, June 2, 1977, pp. x-xi.

C. Program Faculties. In characterizing expertise and qualities to be required of applicants to the faculty, departments and administrative and Senate authorities should recognize the value of the results of affirmative action to the education of their students, and perhaps to coverage of the subject matter as well, and redouble efforts to obtain more women and ethnic minority faculty members.

Program faculty and campus authorities should pay careful attention to the adequacy of offerings and faculty staffing patterns to provide coverage of: the interpretations of subject matter by adherents of schools of thought which are currently underrepresented in a faculty; social issues and responsibilities related to the field; and information or skills useful to students in subsequent careers or in the community at large. Faculty members who appreciate undergraduate advising, informal contact, and writing of recommendations, or who can otherwise contribute to the humanistic components of science students' education, are also needed in greater numbers.

D. Class Size. Curricula should be structured such that all student majors have ready or guaranteed access to at least one small seminar conducted by a regular member of the faculty. This recommendation is no less critical in overenrolled/underfacultied programs, but may necessitate heavy use of very large classes in order to free enough resources to offer a set of small seminars. The Administration should where necessary provide temporary faculty resources to enable this form of curricular design.

E. Student Input/Participation. Program faculty, with the help of staff who can be permanently assigned to the effort, should accept the responsibility to facilitate the organization of undergraduates, and to develop means of obtaining effective undergraduate input to program decision-making. Working with current organizations where such exist, each program should annually call a general meeting of their undergraduates to invite student election of representatives to serve in the decision-making processes. The program should also provide space and a reasonable minimum of support costs for an undergraduate organization. Informational handouts about program governance mechanisms and the means for student input, formal and informal, should be developed. A special committee which includes undergraduates may be needed to review the results of this report, make follow-up recommendations, undertake further information gathering, etc.

All faculty should occasionally use the ASUC Primer questionnaire to evaluate their larger courses and those required for a major, so that students will have access to evaluations of faculty teaching. (Primer also provides full evaluation services.)

DESCRIPTIONS OF SAMPLES

Representativeness of the Sample(s)

There are a number of characteristics of the full sample, and of the total number of students in the programs sampled, which can be used to shed light on the question of whether the respondents are generally representative of the majors as a whole, and in each of the programs surveyed.

The Sample As Drawn. Samples were drawn from a list of upper division major students provided by the Office of Admissions and Records (with information effective as of late November 1976). The OAR list included upper division students who had expressed an intended major but had not yet formally declared their major. Students whose names were listed but who did not or had not yet provided addresses to the OAR were omitted from the sample at the outset (except in History of Art and Spanish in the Selected Humanities sample).* While no close check was made, the proportion of missing addresses seemed to vary somewhat from program to program, from zero to perhaps 10% in a few instances.

Samples of up to size 60 were drawn from the quasi-alphabetical list of majors provided by the OAR. Samples were constituted by selecting every nth name, beginning with a randomly-chosen name in the first nth, the exact size of the "nth" being determined by the number of majors in the program. (When the initial draw exceeded 60, individuals were deleted using much the same procedure.) In cases where there were fewer than 60 majors total, all students were included. For our miscellaneous aggregations of majors in the Physical Sciences, Social Sciences, and Humanities, a sample of size

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*Because of the official status of Academic Review Unit (ARU) work, we requested name lists that included students who did not want their addresses released for unofficial purposes. We were authorized to obtain such lists and informed that the lists we received were complete as requested. (The counts on the OAR list subsequently balanced with Office of Institutional Research counts.) Hence we assume that the names without addresses on these lists simply did not have (local?) addresses at the time of study list filing in the Fall and did not subsequently update OAR records.

Nevertheless, the OAR lists were not always complete. In Art History, ARU Research Assistant Hanami identified 30 additional majors (in Winter Quarter) above and beyond the 78 on the OAR list. Of these additional majors, 21 ultimately responded to the ARU questionnaires. We compared the responses of these students across the entire questionnaire with those of the 43 respondents of the 78 on the OAR list. Of 74 Chi-square tests for differences between the two groups, only one had a probability of difference that was at or below the .05 level (.0293), and three were near .06. Because we conducted so many tests, the likelihood is high that a number of probabilities of this (low) magnitude would occur by chance. Hence we conclude that there are few real differences between Art History students who were and were not included on the OAR lists, and we can have some real hope that the same is true for other majors.

75, proportional to the number of students enrolled in the majors selected for inclusion, was drawn.*

Response Rate. Of 1472 Undergraduate Major Program Evaluation Questionnaires mailed out, 798 were returned — a gross response rate of 54.2%. While this rate is adequate to good for large scale questionnaire research, it is not necessarily outstanding. However, since ARU questionnaires were sent by nonforwardable bulk rate mail, the net response rate (i.e., of those students who actually received a questionnaire) is higher than 54%. Across the total sample, we have calculated that the move rate of students was above 10%, and that the net response rate — a measure certainly of students' interest level in academic program review — is therefore upwards of 60%.**

Concomitantly, however, the sample is biased against students who (have) move(d). We have no information about whether such students have significantly different perceptions of their academic program, but the odds are that they are slightly more critical of their programs.

Demographic Measures. We were also to some extent able to compare the sexual and ethnic distributions of students enrolled in the programs with those majors who responded to the ARU surveys. These comparisons are shown in the accompanying table (on the next page) and in the text following.

Demographic Characteristics of Student Respondents

Departmental or Program Affiliations. The respondents' majors, and the response rate for each of the major programs sampled, as well as overall, are shown in the table on the following page.

Sex and Ethnicity. Across the entire sample of 449 students in the life science-related programs, 43.9% of the respondents are women. This figure corresponds very closely with the percentage of women (44.0%) in the sample as drawn.

In Zoology and Bacteriology, women are perhaps overrepresented among the respondents. However, across the sample as a whole, sexual status of respondent had almost no significant relationships with the evaluative items in the Undergraduate Major Program Evaluation Questionnaire. But no study was made of differences in responses between sexes within any program.

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*See footnote "b" of the table on the following page. In this report, the miscellaneous humanities sample of 75 (with 34 respondents), composed heavily of students in English, has been combined with all the humanities programs surveyed to obtain the "Selected Humanities" sample.

**In order to estimate the "move rate," we randomly labelled 150 out-going envelopes with "return address correction requested." Post Office personnel are supposed to return all undeliverable letters thus marked to the sender, with the new address or notice of its unavailability. Eleven percent (11%) of these address corections were returned to us. In addition, some proportion of these marked envelopes were undoubtedly lost in the shuffle — i.e., delivered to a mailbox but not returned to the P.O. despite the absence of the addressee.

Other indicators provided similar estimates of the move rate (e.g., Spanish Department records in early Winter Quarter). In addition, a number of other students may have graduated, or dropped or stopped out. Others may not have responded because they were new to their major.

LIFE SCIENCE-RELATED SAMPLE: RESPONSE RATES AND PERCENTAGE OF WOMEN

Major Program	Number of Usable Responses[a]	Percent of Major Sample Who Responded[b]	Percent of Life Sci. Subtotal[c]	Representativeness of Sample: Percentage of Women — Fall 1976 OIR data[d]	In Sample As Drawn[e]	Among Respondents
Bacteriology	32	53	7.3	50	55	63
Biochemistry	30	50	6.8	35	33	33
Biology Plan A	32	53	7.3	40	35	34
Biology Plans B,C,D	31	52	7.1		30	29
Biol. of Nat. Resources (BNR)	26	43	5.9	56[f]	58	54
Bio/Medical Physics (BiMdPy)	25	49	5.7	21	27	20
Botany	26	65	5.9	51	53	58
Chemistry (in College of)	28	47	6.4	27[g]	23	18
Chemistry (in L & S)	10	59	2.3	6[f]	6	10
Food, Nutrit., Dietet. (Nutrit)	28	47	6.4	77[f]	77	75
Genetics	27	60	6.2	60[f]	60	56
Health Arts and Sciences (HAS)[h]	4[h]	33	—[h]	58	58	50
Physiology	30	50	6.8	44	45	40
Psychology	24	40	5.5	63	62	54
Public Health[h]	7[h]	58	—[h]	57	58	71
Zoology	32	53	7.3	45	53	63
Major transfers ("OthHlt")	17[a]	—[a]	3.9	—	—	53
Physical Sciences (PhySci)	40	53	9.1	22[d]	24[d]	23
LIFE SCIENCE-RELATED SUBTOTAL[h]	(438)	53	99.9	—	44.0[c]	43.9[c]
Social Sciences[b]	41	55		40d	48[d]	51[d]
Selected Humanities[b]	284	53		60d	65[d]	70[d]
TOTALS	774[a,h]	53		—	52	54

[a] The 17 students who changed to majors other than that indicated for them in the OAR name list, but within the pre-health sciences above, were grouped together to comprise the "major transfers" or "OthHlt" subsample. These 17 students are included in the numerical and percentage (response rate) subtotals, but not in the percentage responding for the programs to which they were initially assigned. In addition, 4 late and 14 other unusable major-change responses were received from across the sample as a whole.

[b] The Selected Humanities sample (and number of respondents) consists of: Art Practice (26), English (20), French (26), German (13), History (35), History of Art (64), Music (38), Spanish (48), Miscellaneous (14). See the companion report on the humanities sample for more information about these programs. (There are also separate reports about the Spanish and Art History programs, the latter including information about graduate student perspectives as well.)

The Social Science respondents consist of majors in: Anthropology (3), Economics (10), Geography (2), Political Science (16), Social Science Field Major (4), and Sociology (6). The Physical Science respondents are from: Astronomy (2), Geology (4), Geophysics (2), Mathematics (12), Physical Sciences (1), Physics (15), and Statistics (4). Unlike the Selected Humanities sample, the Physical and Social Science samples were derived by taking every nth name across a pre-determined list of programs (in order to obtain a sample of 75 students).

[c] Throughout this report, totals are calculated by summing individual responses (rather than by weighting departments equally or by their proportional size). Subtotal for women includes HAS and Public Health.

[d] Office of Institutional Research (OIR) figures are based on Office of Admissions and Records (OAR) figures as of the end of the third week of classes in the Fall Quarter. These figures include students who have formally declared a major as well as intended majors indicated by upper division students in L & S. Our list of names from OAR was drawn a few weeks later (effective in late November). OIR accounting of "headcount" majors also uses ".50 headcount" to represent students enrolled for fewer than 12 units, whereas our counts are purely headcount. In the Physical Sciences and Social Sciences samples, students in the general physical sciences and social sciences (field) majors (see footnote b) have not been included in the OIR-derived percentages, but are included in columns 5 and 6 of the table. The sampling of humanities programs and the choice of sample sizes (which were complete in Art History and Spanish, where other AHU reviews were undertaken) has biased the humanities sample draw toward departments in which there are more women.

[e] Data in this column were compiled by tabulating the apparent sexual status of names in the OAR list.

[f] Figures designated "f" are calculated as in "e" except that all of the majors in the OAR list are used in the calculation. OIR figures do not give sex of student for the two majors in the College of Natural Resources, nor for group majors in L & S.

[g] The OIR figure for Chemistry (in the College of) includes lower division students and probably overestimates the percentage of women in upper division.

[h] In the tables following in the report, we have presented agree-disagree response totals and F-test probabilities for the life science-related programs here subtotalled, i.e., excluding HAS and Public Health. However, demographic characteristics of the sample described in the text are based on 409 responses, excluding Physical Sciences but including HAS and Public Health. The full 449 students in the life science-related areas are incorporated in the grand total presented in this table (only).

Ethnically, 59.7% of the 409 respondents* identified themselves as White/Caucasian, 19.8% as Chinese, 7.3% as Japanese, 6.6% as other minorities, and 6.6% declined to state. The Office of Institutional Research (OIR) Campus Statistics publication does not report ethnic identification by department, but for the biological sciences within L & S as a whole, their data may be compared with that from our respondents.

	Letters & Science Biological Sciences			
	OIR Data, F 1975[a]		ARU Sample[a]	
	Number	Percent	Number	Percent
White/Caucasian	822	58.7	157	59.2
Chinese	266	19.0	55	20.8
Japanese	99	7.1	21	7.9
Other Minority	162	11.6	18	6.8
Decline to state	52	3.7	14	5.3

[a]OIR totals are for all students in the biological sciences in L & S. The ARU sample totals include Bacteriology (32), Biochemistry (30), Biology--Plan A (32), Biology—Plans BCD (31), Bio/medical Physics (25), Botany (26), Genetics (27), Physiology (30), and Zoology (32). Both totals are undergraduates only.

Because the Fall 1975 OIR ethnic minority totals count all majors in L & S, whereas we drew (only) up to 60 students from any one program in Fall 1976, the two sets of figures are not strictly comparable. However, the closeness of the ARU sample to the OIR figures suggests that there are no strong biases in terms of the racial composition of the respondents as compared with the student population in the majors sampled.

Familiarity with Major Program. 1. Source Institution. Virtually half (49.9%) of the respondents had come to Berkeley directly from high school. Over a quarter (27.5%) had last attended a two-year college. The remaining source institutions were nearly evenly divided between other U.C. campuses (10.3%) and other colleges and universities (11.8%). Differences between programs were not significant as regards the source institutions of their students (Chi-square probability = .3835). Nevertheless, Bio/medical Physics, with 84% of its respondent majors coming directly from high school, seemed relatively unique. From 32% to 63% of the respondents in the remaining programs came to Berkeley directly from high school.

2. Courses Completed in Major and Quarters at Berkeley. Across the life science-related sample,* 32.8% of the respondents had completed 9 or more upper division courses in their major program, and another 21.3% had finished 6-8. Just over twenty percent (20.9%) had completed 0-2 courses.**

*Unless otherwise indicated, totals reported hereafter in this demographic section exclude the Physical Sciences sample (N = 40) and include Public Health (N = 7) and Health Arts and Sciences (N = 4), for a total of 409.

**Students with fewer completed upper division courses were more likely to have marked "No Information or Not Applicable" as a response to more of the evaluative questions. About four percent (4.3%) of the respondents had completed no upper division courses by the time they returned the questionnaire, and another 5.8% had completed only one.

But most of the respondents were presumably taking classes currently, and only 11.5% of the respondents had been at UCB for three or fewer quarters. About forty percent (40.4%) had been here 10 or more quarters, and another 22.1% had 7-9 quarters under their belt.

The respondents in the following groups were a little more likely to have completed 0-2 (i.e., fewer) upper division courses in their major (Chi-square probability = .0056)*: Major transfers (41%); Food, Nutrition, and Dietetics (36%), Chemistry (33%), and Bio/medical Physics (32%). By way of contrast, respondents were more likely to be veterans of 3 or more upper division courses in their major in Public Health, L & S Chemistry, and HAS (100% each) and in Psychology (96%), Zoology (94%) and Biology—Plan A (94%).

Partly accounting for the lower number of upper division courses completed in their majors, higher proportions of the respondents in Chemistry (25%), Food, Nutrition and Dietetics (29%), and Major transfers (29%) had been enrolled at Berkeley for three or fewer quarters (compare 11.5% overall). Hence, the proportion of student evaluators who are thoroughly familiar with the two specific programs named above may be somewhat lower than in much of the remainder of the sample (Chi-square probability = .0073).*

Although 32% of the respondents in Bio/medical Physics had completed only 0-2 upper division courses in their major, 88% of these Bio/medical Physics majors, as well as large proportions of the respondents from Genetics (85%), Psychology (83%) and L & S Chemistry (80%) were likely to have been at Berkeley for 7 or more quarters (compare 62.5% overall).

And although the response rate for Psychology is not particularly high (40%), the respondent majors show considerable familiarity with their program at Berkeley by the two measures employed above. L & S Chemistry major respondents, with a better response rate (59%) but a low number of respondents (10), also seemed to report a higher familiarity with their program.

Employment and Finances. There were no significant differences between the respondents in the various majors as regards the proportion of the total cost of college that their parents were willing or able to provide (Chi-square probability = .4189).* Overall, 31.7% of the respondents' parents were willing or able to provide 81-100% of the costs, and 21.4% were willing or able to provide none of it. There were also no significant differences by program in the respondents' current employment patterns (Chi-square probability = .3771).* Overall, 51.9% of the respondents were not employed at all and the rest, to varying degrees, were.

Academic Workload. The average number of units taken was fairly similar from program to program (F probability = .742; includes Physical Sciences, excludes HAS and Public Health). Hours of study per week outside of class were also fairly similar across the life science related programs (Chi-square probability = .0926).* (See also pp. 18-19.)

*Chi-square calculation based on somewhat fewer numbers of people than is appropriate statistically for the number of combinations of programs and response categories.

THE INTERPRETATION OF THE QUESTIONNAIRE DATA

Questionnaire Development

Development of the general Undergraduate Major Program Evaluation Questionnaire began in late 1975, as a joint Academic Affairs Office/Jeff Koon project. Last year's draft version was used as a guide in questionnaire development by some ARU staff as well as by some ASUC Mini-Grant recipients. This year, the item content of last year's draft was reviewed systematically, with reference to various sets of program review criteria, in order to enable inquiry into the most fundamental concerns in program review about which undergraduates might reasonably be expected to have knowledge or views. Three student review committees (pre-health sciences, History of Art, Spanish) as well as ARU staff, some Academic Affairs Office staff and an ASUC Senator or two helped in the extensive refinement of the items during the Fall of 1976.

Absolute and Relative Perspectives on the Data

In the interpretation of the questionnaire data contained in this text, there are two principal kinds of analytic perspectives employed. The first, or "absolute" perspective, focuses on the percentage of students who chose one (or more) response categories as contrasted with the percentage who chose other response categories. (See below for response categories.) The second, or "relative" perspective, is one that compares the evaluations by students of their respective programs.

The relative perspective can be particularly important in identifying the comparative strengths and weaknesses of the various programs evaluated. In areas where a department is relatively strong, it may serve as a possible model for other academic units or programs. Similarly, in areas where at least some other programs are relatively stronger, there is a good likelihood that improvement in weaker programs is fairly readily possible. In areas where all programs are rated as having about the same degree of weakness, change may be needed across the board, but <u>may</u> be more difficult or require new methods. In addition, without the relative perspective, we cannot gain nearly as good an idea of whether a moderate level of agreement or disagreement (e.g., 40%) by students to a particular questionnaire item is suggestive of an effective or ineffective performance by the academic program.

Analysis of Means

In making comparisons or relative judgments between students' ratings of various academic programs, we have relied upon the F-test to ascertain whether there are "significant" differences in the average (mean) ratings by their students. For purposes of calculating the mean ratings,

1 = Strongly Disagree
2 = Disagree
3 = In Between
4 = Agree
5 = Strongly Agree

Data from students who used the response category "No Information or Not Applicable" (or who left the question blank) were omitted from all reported percentages and F-tests, but the reader may calculate the overall percentage of such "nonapplicable" responses by comparing the total number of applicable responses (presented in the tables) with the total sample size of 438 for these analyses.

The tables present the probability that there are significant differences between the mean ratings of the various programs. The confidence intervals associated with each mean (e.g., "± 0.47") indicate that there is a 95% chance that the "true" mean for a particular program falls within the range indicated (e.g., plus or minus 0.47 from the reported mean). Where the probability was high that all observed differences occurred by chance, we have typically presented a table in which the mean rating is not reported for every program.

Reporting the Data

If the confidence intervals (95% probability range) for any two program means do not overlap, the programs may be said to have significantly different ratings. While generally following this guideline, the discussions in the text have taken a little liberty in interpretation, partly because the obtained means are the best estimate we have of a program's standing, but also because of the awkwardness of omitting programs with equivalent means but wider confidence intervals from the listing of high- or low-rated programs. Nevertheless, we have tried to choose wordings for the text with a considerable sense of responsibility and caution. The reader may, of course, make his or her own interpretations by reference to the tables.

For the typical item on which differences between programs are reported in the text, the reader should also be aware that the low-rated programs are generally different from the high-rated programs mentioned, but that neither is significantly different from the large array of programs with means in the middle ranks. Some of the high- and low-rated programs, however, may well be significantly different from the overall sample mean, which has a small confidence interval because of the large number of respondents.

In reporting percentages in the text, the response categories of "Strongly Agree" and "Agree" are combined (to "agree"), as are "Strongly Disagree" and "Disagree" (to "disagree"). The response category "In Between" has been retained as a separate (third) entity and may be calculated from the other two values given in the text or by reference to the tables.

Findings

CURRICULUM

Structure of the Major (Data Tables—1)

Student ratings of the life science-related programs surveyed generally indicated (59% disagreed, 29% agreed) that there were few "artificial" prerequisites to the majors, particularly in Physical Sciences, the two chemistry majors (in L & S and in the College of Chemistry), and Biochemistry. However, students in the College of Natural Resources majors surveyed — Biology of Natural Resources (BNR) and Food, Nutrition & Dietetics (Nutrition) — and in Zoology and Physiology expressed more agreement than disagreement with the proposition that "some of the lower division prerequisites are not really necessary for the major."

In most of the programs surveyed, at least half of the respondents were satisfied with the fit of their specialized interests and the course plan options available within their major. Overall, 62% agreed and 20% disagreed. But disagreement exceeded agreement in Physiology. Students in Zoology, BNR, Genetics, and Biology—Plan A were very clearly happy with the number of options open to them.

Generally speaking, the respondents did not feel that there were too many courses required for their major — 61% disagreed, 16% agreed — but sentiments were evenly divided in Biology—Plan A. The number of requirements was also somewhat in question in the two Chemistry majors and in Bio/medical Physics. (The number of required courses was actually most disconcerting to those who had changed majors within the pre-health science-related fields — i.e., excluding Physical Sciences.) Requirements were least likely to be seen as too numerous in Biochemistry, Psychology, and Botany.

Coverage of Content in the Major (Data Tables—1-3)

The respondents generally agreed (63%, versus 18% who disagreed) that advanced courses were offered in their program (or otherwise available) in all of their areas of interest, but the students in Biology—Plans BCD and in L & S Chemistry were rather evenly divided in their opinions. There was high satisfaction on this score in Physical Sciences (especially) and in Chemistry and Genetics.

Fragmentation of subject matter was not a problem within these upper division major programs. Overall, only 11% of the students agreed that their program's courses "do not relate well to each other; it is hard to get a good perspective on the field" (73% disagreed). Fragmentation of curriculum was rated lowest in Botany, Nutrition, Zoology, and Biochemistry. Even in Biology—Plan A and Genetics, which were rated as less well-integrated, only about 23% of the respondents agreed with this proposition (52-56% disagreed, few "strongly" so).

CURRICULUM

Structure of the Major

Some of the lower division prerequisites are not really necessary for the major. [col. 46]

TOTALS — Life Science-Related Programs*

16% S. Disagree | 11% S. Agree
43% Disagree | 12% In Between | 18% Agree

Mean: 2.64 ± 0.12 (421) F-probability = .001

Prog.	Mean	95% Conf.	N									
PhySci	2.00	± 0.38	(37)	LSChem	2.30	± 0.68	(10)	Psych	2.73	± 0.58	(22)	Physio 3.04 ± 0.60 (28)
Chem	2.11	0.40	(28)	SOCSCI	2.31	0.37	(35)	BioBCD	2.83	0.55	(29)	Nutrit 3.07 0.58 (27)
BiMdPy	2.13	0.42	(23)	Bact	2.61	0.46	(31)	OthHlt	2.88	0.75	(17)	ENR 3.12 0.56 (25)
HUMANS	2.17	0.14	(241)	Botany	2.64	0.47	(25)	Genet	2.93	0.54	(27)	
BioChm	2.28	0.34	(29)	BioA	2.66	0.37	(32)	Zoo	3.03	0.41	(31)	

There are enough course plan options to meet my specialized interests in the major. [col. 34]

TOTALS — Life Science-Related Programs*

6% S. Disagree | 19% S. Agree
14% Disagree | 17% In Between | 43% Agree

Mean: 3.54 ± 0.11 (419) F-probability = .018

Prog.	Mean	95% Conf.	N									
HUMANS	2.81	± 0.16	(272)					BioA	3.80	± 0.32	(30)	ENR 3.96 ± 0.35 (26)
Physio	2.93	0.52	(28)					SOCSCI	3.85	0.38	(38)	Zoo 4.03 0.37 (32)
LSChem	3.20	0.74	(10)	PhySci	3.67	± 0.33	(36)	Genet	3.92	0.48	(26)	

There are too many required courses for the major. [col. 35]

TOTALS — Life Science-Related Programs*

10% S. Disagree | 4% S. Agree
51% Disagree | 23% In Between | 12% Agree

Mean: 2.50 ± 0.09 (430) F-probability = .000

Prog.	Mean	95% Conf.	N									
BioChm	2.07	± 0.30	(29)	Bact	2.34	± 0.25	(32)	BioBCD	2.48	± 0.38	(31)	LSChem 2.90 ± 0.63 (10)
Psych	2.08	0.37	(24)	PhySci	2.36	0.28	(39)	Physio	2.55	0.43	(29)	BioA 3.00 0.37 (30)
Botany	2.08	0.33	(24)	HUMANS	2.37	0.12	(278)	Nutrit	2.68	0.32	(28)	OthHlt 3.18 0.64 (17)
SOCSCI	2.15	0.29	(41)	ENR	2.38	0.34	(26)	BiMdPy	2.80	0.46	(25)	
Zoo	2.32	0.32	(31)	Genet	2.48	0.40	(27)	Chem	2.86	0.44	(28)	

Coverage of Content in the Major

Advanced courses are offered in the major (or are otherwise available) in all of my areas of interest. [col. 42]

TOTALS — Life Science-Related Programs*

4% S. Disagree | 13% S. Agree
14% Disagree | 19% In Between | 50% Agree

Mean: 3.55 ± 0.10 (389) F-probability = .003

Prog.	Mean	95% Conf.	N									
HUMANS	2.81	± 0.15	(247)	Zoo	3.42	± 0.38	(31)	ENR	3.50	± 0.47	(24)	Chem 3.86 ± 0.31 (28)
LSChem	3.00	0.75	(10)	BioChm	3.46	0.43	(24)	SOCSCI	3.54	0.33	(35)	OthHlt 3.90 0.63 (10)**
BioBCD	3.03	0.47	(30)	Nutrit	3.48	0.34	(21)	BiMdPy	3.61	0.43	(23)	PhySci 4.13 0.24 (38)
Botany	3.24	0.51	(25)	BioA	3.48	0.32	(27)	Bact	3.67	0.37	(24)**	
Psych	3.27	0.58	(22)	Physio	3.50	0.42	(26)	Genet	3.81	0.32	(26)	

*Please see "Descriptions of Samples," especially regarding HUMANS, SOCSCI, PhySci, OthHlt, Nutrit. Life science-related totals (and F-tests) exclude HAS and Public Health as well as HUMANS and SOCSCI.

**Percentage of "No Information or Not Applicable" and blank responses is 25% or more.

The courses in this program do not relate well to each other; it is hard to get a good perspective on the field. [col. 37]

TOTALS — Life Science-Related Programs*

18% S. Disagree 2% S. Agree
55% Disagree 16% In Between 9% Agree

Mean: 2.23 ± 0.09 (422) F-probability = .001

Prog.	Mean	95% Conf.	N									
Botany	1.81	± 0.20	(26)	Bact	2.10	± 0.20	(30)	HUMANS	2.33	± 0.12	(265)	ENR	2.50	± 0.38	(26)
Nutrit	1.93	0.38	(28)	BiMdPy	2.13	0.40	(24)	Psych	2.33	0.43	(24)	Genet	2.67	0.42	(27)
Zoo	1.93	0.29	(30)	Physio	2.16	0.44	(25)	SOCSCI	2.34	0.34	(38)	BioA	2.74	0.33	(31)
BioChm	1.97	0.26	(29)	Chem	2.29	0.38	(28)	BioBCD	2.45	0.36	(31)				
PhySci	2.08	0.35	(37)	OthHlt	2.31	0.42	(16)	LSChem	2.50	0.61	(10)				

Most of the upper division courses in the program waste a lot of class time helping the students with no background in the subject. [col. 49]

TOTALS — Life Science-Related Programs*

27% S. Disagree 2% S. Agree
57% Disagree 10% In Between 4% Agree

Mean: 1.96 ± 0.08 (395) F-probability = .037

Prog.	Mean	95% Conf.	N									
Physio	1.68	± 0.28	(28)	PhySci	1.86	± 0.25	(37)	⋮				⋮			
Chem	1.75	0.29	(24)	⋮											
⋮				HUMANS	2.15	0.12	(250)	SOCSCI	2.32	± 0.31	(37)	ENR	2.57	± 0.52	(23)

There are enough fieldwork, internship, lab, or other academic-experiential course offerings in this program, and/or credit is readily available for appropriate types of volunteer experience. [col. 39]

TOTALS — Life Science-Related Programs*

10% S. Disagree 14% S. Agree
18% Disagree 21% In Between 37% Agree

Mean: 3.25 ± 0.12 (366) F-probability = .352

Range: HUMANS 2.13 ± 0.18(161)**; SOCSCI 2.71 ± 0.50 (28)**; BiMdPy 2.79 ± 0.59 (19) to ENR 3.65 ± 0.49 (20).

The program's methodology or technical courses: Should put more emphasis on general theoretical understanding rather than application. [col. 44]

TOTALS — Life Science-Related Programs*

12% S. Disagree 1% S. Agree
56% Disagree 26% In Between 5% Agree

Mean: 2.27 ± 0.08 (392) F-probability = .350

Range: OthHlt 2.00 ± 0.51 (15) to LSChem 2.70 ± 0.35 (10), including HUMANS** and SOCSCI.

The program's methodology or technical courses: Do not provide the student with enough experience in real problem-solving and analysis. [col. 43]

TOTALS — Life Science-Related Programs*

9% S. Disagree 5% S. Agree
42% Disagree 25% In Between 19% Agree

Mean: 2.68 ± 0.10 (389) F-probability = .001

Prog.	Mean	95% Conf.	N									
PhySci	2.25	± 0.30	(36)	BioChm	2.46	± 0.42	(26)	Zoo	2.79	± 0.34	(29)	SOCSCI	3.11	± 0.38	(37)
BiMdPy	2.30	0.38	(23)	ENR	2.57	0.34	(23)	Chem	2.80	0.46	(25)	BioBCD	3.15	0.39	(27)
Bact	2.43	0.34	(28)	LSChem	2.70	0.59	(10)	Psych	2.86	0.49	(22)	BioA	3.37	0.39	(30)
Genet	2.44	0.45	(25)	Botany	2.71	0.36	(21)	OthHlt	2.93	0.68	(15)				
Nutrit	2.44	0.48	(25)	Physio	2.79	0.39	(24)	HUMANS	3.01	0.20	(150)**				

*Please see "Description of Samples," especially regarding HUMANS, SOCSCI, PhySci, OthHlt, Nutrit. Life science-related totals (and F-tests) exclude HAS and Public Health as well as HUMANS and SOCSCI.

**Percentage of "No Information or Not Applicable" and blank responses is 25% or more.

According to 84% of our respondents, there was not much waste of class time to help students with weak preparation in the subject matter. Differences between program ratings were modest — Physiology and Chemistry less wasteful than ENR — and 70% or more of the students in every program disagreed that time was wasted on unnecessary review in most of their courses.

The availability of enough fieldwork, internships, labs, or other academic-experiential course offerings, or credit for appropriate types of volunteer experience was generally acknowledged (51% agreed, 28% disagreed), and there were no significant differences between the life science-related programs. Nevertheless, disagreement exceeded agreement in some programs, and a sizable proportion of students chose the "In Between" rating.

With respect to methodology or technical courses, none of the program's students wanted more emphasis on theoretical understanding as contrasted with application (68% disagreed, 6% agreed), and there were no differences between program ratings. There were differences, however, in whether students felt they were provided with enough real problem-solving experience. For the sample as a whole, 24% agreed and 51% disagreed that problem-solving and analytical experiences were insufficient. In the Biology Plans (A,BCD), more students agreed (41-51%) than disagreed (26-27%). Students were particularly satisfied on this score in Physical Sciences and Bio/medical Physics.

Overemphasis on traditional methodologies or values, or out-of-date training in methodology, was not a problem for 74% of the students (and was for only 8%). The majors seemed particularly impressed in Biochemistry, Physiology, Bacteriology, Physical Sciences, Nutrition, and Bio/medical Physics.

Interpretation of Content (Data Tables—3)

A question about the availability of courses exploring the contributions of nondominant "schools of thought" was characterized by a low proportion of applicable responses (39%) and large but nonsignificant differences between average ratings of programs. Applicable responses tended to be disagreements (52%) rather than agreements (27%).

When asked whether their faculty showed enough concern about social issues in teaching their subjects, 73% of the respondents gave applicable responses, and more agreed (46%) than disagreed (22%). Applicable student responses in the two chemistry majors, however, showed much more disagreement than agreement. The two College of Natural Resources majors (ENR, Nutrition), Genetics, and the Social Sciences received relatively high ratings.

Class Size (Data Tables—3)

Large class sizes were not seen generally by students as being able to provide adequate learning opportunities, but in many cases the student response was split nearly evenly between agree and disagree. Interestingly enough, the two Natural Resources programs received opposite rankings, with large classes being very largely unacceptable in ENR and somewhat acceptable in Nutrition.

The program's methodology or technical courses: Overemphasize traditional methodology and values or are not up-to-date. [col. 45]

TOTALS — Life Science-Related Programs*

2% S. Disagree, 53% Disagree, 18% In Between, 6% Agree, 2% S. Agree

Mean: 2.15 ± 0.09 (381) F-probability = .002

Prog.	Mean	95% Conf.	N	Prog.	Mean	95% Conf.	N	Prog.	Mean	95% Conf.	N	Prog.	Mean	95% Conf.	N
BioChm	1.75	± 0.29	(24)	BiMdPy	2.00	± 0.31	(22)	ENR	2.35	± 0.28	(23)	SOCSCI	2.61	± 0.41	(36)
Physio	1.78	0.29	(23)	Zoo	2.10	0.37	(29)	BioA	2.42	0.31	(31)	LSChem	2.67	0.67	(9)
Bact	1.81	0.25	(27)	Genet	2.18	0.45	(22)	BioBCD	2.45	0.41	(29)	HUMANS	2.98	0.20	(164)**
PhySci	1.91	0.24	(33)	Chem	2.22	0.37	(23)	Psych	2.50	0.56	(24)				
Nutrit	1.96	0.42	(24)	Botany	2.22	0.29	(23)	OthHlt	2.60	0.58	(15)				

Interpretation of Content

There are enough courses available in this program which explore the contributions of the nondominant "schools of thought" (e.g., radicals, conservatives, traditionalists, futurists, women, minorities, etc.). [col. 48]

TOTALS — Life Science-Related Programs*

17% S. Disagree, 35% Disagree, 22% In Between, 21% Agree, 6% S. Agree

Mean: 2.64 ± 0.17 (172)** F-probability = .083

Range: BioA 1.86 ± 0.44 (14)** to Genet 3.50 ± 0.61 (10)**, including HUMANS** and SOCSCI.

Faculty in this program show enough concern about social issues in teaching their subjects. [col. 30]

TOTALS — Life Science-Related Programs*

5% S. Disagree, 17% Disagree, 32% In Between, 34% Agree, 12% S. Agree

Mean: 3.30 ± 0.12 (320)** F-probability = .000

Prog.	Mean	95% Conf.	N	Prog.	Mean	95% Conf.	N	Prog.	Mean	95% Conf.	N	Prog.	Mean	95% Conf.	N
Chem	2.29	± 0.62	(14)**	Psych	3.09	± 0.57	(23)	Physio	3.42	± 0.46	(19)**	OthHlt	3.77	± 0.61	(13)
LSChem	2.50	0.77	(8)	BioChm	3.09	0.45	(22)**	Bact	3.45	0.39	(20)**	Nutrit	3.85	0.39	(27)
PhySci	2.90	0.45	(20)**	BioA	3.14	0.40	(29)	Botany	3.50	0.51	(12)**	ENR	3.89	0.42	(19)
HUMANS	3.03	0.18	(198)**	Zoo	3.21	0.43	(24)**	SOCSCI	3.65	0.37	(40)				
BioBCD	3.07	0.36	(27)	BiMdPy	3.32	0.51	(19)	Genet	3.75	0.40	(24)				

Class Sizes

Large lecture classes can generally provide adequate learning opportunities in this field. [col. 38]

TOTALS — Life Science Related Programs*

12% S. Disagree, 34% Disagree, 27% In Between, 25% Agree, 3% S. Agree

Mean: 2.73 ± 0.10 (400) F-probability = .004

Prog.	Mean	95% Conf.	N	Prog.	Mean	95% Conf.	N	Prog.	Mean	95% Conf.	N	Prog.	Mean	95% Conf.	N
ENR	1.90	± 0.40	(20)	SOCSCI	2.57	± 0.33	(37)	Psych	2.79	± 0.37	(24)	Bact	2.97	± 0.33	(31)
BioA	2.38	0.35	(32)	LSChem	2.60	0.50	(10)	Zoo	2.84	0.42	(32)	Physio	3.07	0.41	(29)
PhySci	2.47	0.45	(30)**	Botany	2.62	0.53	(21)	BiMdPy	2.85	0.49	(20)	Nutrit	3.24	0.36	(25)
Genet	2.52	0.40	(27)	OthHlt	2.63	0.64	(16)	Chem	2.88	0.44	(24)				
HUMANS	2.54	0.16	(210)**	BioBCD	2.74	0.39	(31)	BioChm	2.89	0.32	(28)				

The curriculum is structured so that all majors will have a sufficient number of small seminars. [col. 40]

TOTALS — Life Science-Related Programs*

15% S. Disagree, 43% Disagree, 20% In Between, 18% Agree, 3% S. Agree

Mean: 2.51 ± 0.12 (298)** F-probability = .000

Prog.	Mean	95% Conf.	N	Prog.	Mean	95% Conf.	N	Prog.	Mean	95% Conf.	N	Prog.	Mean	95% Conf.	N
Physio	1.90	± 0.34	(20)**	Chem	2.38	± 0.55	(16)**	LSChem	2.63	± 0.43	(8)	HUMANS	3.07	± 0.16	(220)**
BioA	1.92	0.30	(26)	Botany	2.38	0.55	(16)**	Genet	2.71	0.54	(21)	ENR	3.20	0.74	(10)**
Bact	2.00	0.27	(22)**	BioBCD	2.39	0.47	(23)**	PhySci	2.85	0.42	(27)**	Nutrit	3.45	0.54	(20)**
Zoo	2.35	0.36	(23)**	SOCSCI	2.40	0.43	(35)	OthHlt	2.89	1.05	(9)**				
Psych	2.37	0.51	(19)	BiMdPy	2.50	0.60	(18)**	BioChm	2.90	0.50	(20)**				

*Please see "Description of Samples," especially regarding HUMANS, SOCSCI, PhySci, OthHlt, Nutrit. Life science-related totals (and F-tests) exclude HAS and Public Health as well as HUMANS and SOCSCI.

**Percentage of "No Information or Not Applicable" and blank responses is 25% or more.

Only 68% of the students gave applicable responses to a question regarding whether there were enough small seminars in their program, and most disagreed (58% versus 21% agree). Students in Physiology, Biology—Plan A, and Bacteriology were most dissatisfied with this aspect of their curricular structure, and only in the Natural Resources majors did agreement exceed disagreement.

Scheduling of Courses (Data Tables—4)

Poor scheduling — courses needed or desired by students offered at the same time, crowded into the same quarter(s), or unavailable — was seen as a problem by 35% of the respondents and was not by 41%. In comparison to other majors, course scheduling was a very important problem in Psychology and Biology—Plan A, but more students tended to agree than disagree in a number of other majors as well. Biochemistry was noteworthy for its definite lack of problems with course scheduling, and Bio/medical Physics and Chemistry students also seemed more satisfied than most.

Equipment (Data Tables—4)

Shortages of adequate equipment did not seem to be a serious problem in undergraduate instruction in most programs, although student sentiments were rather evenly divided in several instances. Overall, 57% disagreed that there was a shortage of adequate equipment or supplies, and 22% agreed. Problems seemed most significant in Genetics and Biology—Plan A, and possibly in BNR and the two Chemistry majors. Equipment was little or no problem at all for undergraduates in Bacteriology (especially), Biochemistry, Botany, and Physical Sciences.

Competition, Workload, Grading, Testing (Data Tables—4-5)

More students disagreed (47%) than agreed (27%) that they study and learn best in an environment with competition at a level such as we have here at Berkeley. There was a large variation in responses within most programs, however, such that there were no significant differences between their mean ratings. At its maximum, agreement reached just above the midpoint (in Chemistry, which appeared to differ from Botany).

Students in every program tended to agree that they faced the most rigorous grading practices, and that it is hard to get an "A." Overall, 62% agreed and 10% disagreed. Grading seemed most overly rigorous in the Biology Plans (A,BCD), Zoology, Physiology, the two chemistry majors, and Bio/medical Physics, and complaints seemed lowest in Botany and Nutrition.

In a similar vein, students in almost all the programs (71% overall) believed that they had to do a lot of work for the number of units awarded. Eleven percent (11%) disagreed. These sentiments were nearly unanimous in the two chemistry majors (80% "strongly agree"), and very high in Physiology, Biology—Plan A, and Bio/medical Physics as well. In Psychology, more students disagreed (44%) than agreed (26%) that they were overworked for the number of units awarded, and the same was true in the miscellaneous sample of Social Sciences.

Scheduling of Courses

Scheduling of courses is poor in this program: Required courses or subjects of interest to me are offered at the same time, in the same quarter, or are not being offered this year. [col. 36]

TOTALS — Life Science-Related Programs*

7% S. Disagree, 34% Disagree, 23% In Between, 12% S. Agree, 23% Agree

Mean: 2.97 ± 0.11 (418) F-probability = .000

Prog.	Mean	95%	N									
BioChm	1.96	± 0.24	(26)	PhySci	2.77	± 0.37	(39)	ENR	3.17	± 0.53	(23)	HUMANS 3.28 ± 0.14 (270)
BiMdPy	2.44	0.38	(25)	Physio	2.93	0.46	(28)	SOCSCI	3.18	0.41	(39)	BioA 3.74 0.35 (31)
Chem	2.52	0.38	(25)	OthHlt	3.07	0.57	(15)	Zoo	3.19	0.31	(32)	Psych 3.78 0.45 (23)
Nutrit	2.73	0.52	(26)	Botany	3.08	0.43	(26)	LSChem	3.20	0.74	(10)	
Bacter	2.74	0.39	(31)	BioBCD	3.13	0.48	(31)	Genet	3.26	0.56	(27)	

Equipment

There is a shortage of adequate equipment, supplies or media materials for use by students in this program. [col. 41]

TOTALS — Life Science-Related Programs*

11% S. Disagree, 46% Disagree, 22% In Between, 6% S. Agree, 16% Agree

Mean: 2.59 ± 0.11 (370) F-probability = .006

Prog.	Mean	95% Conf.	N									
Bact	2.07	± 0.31	(27)	Nutrit	2.50	± 0.41	(24)	Psych	2.82	± 0.58	(17)**	BioA 3.00 ± 0.37 (31)
BioChm	2.21	0.39	(28)	OthHlt	2.50	0.54	(14)	SOCSCI	2.84	0.43	(19)**	Genet 3.09 0.47 (22)
Botany	2.31	0.36	(26)	BioBCD	2.55	0.43	(29)	Chem	2.85	0.48	(26)	ENR 3.13 0.59 (15)**
PhySci	2.32	0.36	(31)	BiMdPy	2.67	0.61	(18)**	LSChem	2.90	0.86	(10)	
Physio	2.46	0.38	(26)	Zoo	2.69	0.44	(26)	HUMANS	3.00	0.17	(196)**	

Competition, Workload, Grading, Testing

I study and learn best in an environment with competition at a level such as we have here at Berkeley. [col. 58]

TOTALS — Life Science-Related Programs*

21% S. Disagree, 26% Disagree, 26% In Between, 9% S. Agree, 18% Agree

Mean: 2.68 ± 0.12 (421) F-probability = .236

Range: Botany 2.08 ± 0.43 (26) to Chem 3.12 ± 0.48 (25), including HUMANS and SOCSCI.

Grading in this program is more rigorous than in most—it is very hard to get an "A." [col. 21]

TOTALS — Life Science-Related Programs*

1% S. Disagree, 9% Disagree, 28% In Between, 27% S. Agree, 35% Agree

Mean: 3.78 ± 0.09 (411) F-probability = .000

Prog.	Mean	95% Conf.	N									
SOCSCI	3.25	± 0.29	(40)	HUMANS	3.52	± 0.12	(271)	BiMdPy	4.00	± 0.37	(23)	BioBCD 4.13 ± 0.31 (30)
Botany	3.28	0.30	(25)	PhySci	3.57	0.34	(37)	Chem	4.00	0.35	(27)	Zoo 4.16 0.36 (32)
Nutrit	3.29	0.35	(28)	Bacter	3.58	0.38	(26)	Physio	4.00	0.38	(27)	BioA 4.17 0.33 (30)
ENR	3.41	0.43	(22)	Genet	3.67	0.35	(27)	OthHlt	4.06	0.53	(16)	
Psych	3.42	0.43	(24)	BioChm	3.75	0.40	(28)	LSChem	4.11	1.05	(9)	

Compared to work in other programs, the students in this program must do a lot of work for the number of units (credit) awarded. [col. 47]

TOTALS — Life Science-Related Programs*

2% S. Disagree, 9% Disagree, 18% In Between, 40% S. Agree, 31% Agree

Mean: 3.99 ± 0.10 (417) F-probability = .000

Prog.	Mean	95% Conf.	N									
SOCSCI	2.62	± 0.23	(34)	Nutrit	3.70	± 0.44	(27)	PhySci	4.03	± 0.35	(38)	OthHlt 4.63 ± 0.33 (16)
Psych	2.74	0.53	(23)	ENR	3.74	0.44	(23)	Bact	4.14	0.32	(29)	LSChem 4.70 0.48 (10)
HUMANS	3.45	0.14	(260)	BioChm	3.76	0.48	(29)	BiMdPy	4.30	0.30	(23)	Chem 4.71 0.23 (28)
Botany	3.58	0.41	(26)	BioBCD	3.94	0.34	(31)	BioA	4.31	0.32	(29)	
Genet	3.62	0.44	(26)	Zoo	4.00	0.34	(31)	Physio	4.36	0.34	(28)	

*Please see "Description of Samples," especially regarding HUMANS, SOCSCI, PhySci, OthHlt, Nutrit. Life science-related totals (and F-tests) exclude HAS and Public Health as well as HUMANS and SOCSCI.

**Percentage of "No Information or Not Applicable" and blank responses is 25% or more.

We also attempted to analyze workload by dividing the number of units carried by the number of hours that student reported they studied outside of class. The results, however, are highly suggestive rather than precise for several reasons: 1) students do not take classes solely in their own major; 2) grades earned may vary from student to student;* 3) the number of class hours (lecture plus laboratory or section) varies from program to program; and 4) it is not entirely clear what constitutes "study," particularly in nonscience departments where serious unassigned reading or uncredited experiential learning activities may not have been included in students' reported study time.

In any case, the results of this second analysis (which have not been subjected to statistical treatment) suggest that outside hours of study per unit was higher in Chemistry (1.83 hours/unit), Physical Sciences (1.76), Nutrition (1.73), Bacteriology (1.70) and Biochemistry (1.70), and lower in Botany (1.33), ENR (1.33), and Zoology (1.35), as well as in the miscellaneous sample of Social Sciences (1.10).

Students were about equally divided (36% disagreed, 32% agreed) about whether faculty were clear at the outset of classes about course goals and what students have to know or do to get an "A." The Nutrition faculty, with ratings significantly above almost every other program (64% agree, 7% disagree), seemed to provide the most effective model, and Botany received decent ratings for clarity as well (54% agree, 15% disagree). Although responses were nearer to evenly split between agree and disagree, Physical Sciences, ENR, and Genetics ranked third through fifth in clarity of course goals. According to their students, faculty in Physiology, Biology—Plan A, Chemistry, and possibly Psychology were the principal leaders in ambiguity of course goals and workload or knowledge expectations.

Tests given by the program's faculties were generally regarded as fairly accurate in measuring the students' knowledge of material in most of the courses in their own majors (53% agreed, 20% disagreed). But in Psychology, where there was more disagreement than agreement, students gave lower ratings than in many other cases. ("Fairly accurate" measurement in "most classes" hardly seems like too much to ask.)

TEACHING

See also: "Informal Relations with Students," "Competition, Workload, Grading, Testing," "Interpretation of Content," and "Students' Goals and the Program's Contribution Thereto."

Lectures and coursework within the students' own major programs were definitely regarded as interesting and challenging, with 75% of the students

*We asked students only for their GPA in upper division courses in their major.

Faculty in my program clearly state at the outset what the courses will cover and what students need to know or do to get an "A." [col. 23]

TOTALS —Life Science-Related Programs*

7% S. Disagree 6% S. Agree
29% Disagree 32% In Between 26% Agree

Mean: 2.95 ± 0.10 (421) F-probability = .000

Prog.	Mean	95% Conf.	N									
Physio	2.55	± 0.36	(29)	BioChm	2.78	± 0.37	(27)	OthHlt	2.88	± 0.72	(16)	PhySci 3.16 ± 0.36 (38)
BioA	2.56	0.38	(32)	Zoo	2.78	0.34	(32)	LSChem	2.90	0.63	(10)	Botany 3.46 0.40 (26)
Psych	2.67	0.49	(24)	Bact	2.83	0.33	(30)	BioBCD	2.90	0.36	(30)	Nutrit 3.93 0.38 (28)
HUMANS	2.70	0.13	(266)	SOCSCI	2.85	0.31	(40)	Genet	3.08	0.38	(26)	
Chem	2.70	0.34	(27)	BiMdPy	2.86	0.48	(22)	ENR	3.08	0.37	(24)	

Tests given by faculty in this program have measured fairly accurately my knowledge of the material in most of my courses. [col. 22]

TOTALS — Life Science-Related Programs*

6% S. Disagree 9% S. Agree
14% Disagree 27% In Between 44% Agree

Mean: 3.36 ± 0.10 (419) F-probability = .022

Prog.	Mean	95% Conf.	N									
Psych	2.78	± 0.43	(23)	HUMANS	3.50	± 0.12	(259)	Botany	3.65	± 0.47	(26)	Genet 3.69 ± 0.44 (26)
BioA	3.00	0.38	(32)	Bact	3.54	0.29	(28)	Nutrit	3.68	0.37	(28)	
⋮				SOCSCI	3.56	0.31	(41)	PhySci	3.69	0.31	(39)	

TEACHING

N.B.: See also "Informal Relations with Students," "Competition, Workload, Grading, Testing," "Interpretation of Content," "Students' Goals and the Program's Contribution Thereto."

The lectures and coursework in this program are interesting and challenging. [col. 27]

TOTALS — Life Science-Related Programs*

1% S. Disagree 25% S. Agree
4% Disagree 20% In Between 50% Agree

Mean: 3.95 ± 0.08 (427) F-probability = .581

Range: Psych 3.63 ± 0.45 (24) to PhySci 4.13 ± 0.24 (40), including SOCSCI and HUMANS.

Comments or review provided by faculty, T.A.s and readers on my midterms, papers, problem sets, experiments and class performance is usually thorough enough. [col. 20]

TOTALS — Life Science-Related Programs*

6% S. Disagree 8% S. Agree
23% Disagree 29% In Between 35% Agree

Mean: 3.15 ± 0.10 (417) F-probability = .027

Prog.	Mean	95%	N									
Psych	2.46	± 0.37	(24)	SOCSCI	2.98	± 0.36	(40)	Genet	3.30	± 0.45	(27)	HUMANS 3.46 ± 0.13 (269)
LSChem	2.80	0.56	(10)	⋮				Chem	3.32	0.37	(28)	Botany 3.46 0.47 (26)
BioA	2.84	0.29	(32)					OthHlt	3.33	0.62	(15)	Nutrit 3.56 0.39 (27)
⋮				Zoo	3.25	0.34	(32)	PhySci	3.35	0.34	(40)	

Most of the faculty in this program are receptive to student input on class structure and content. [col. 24]

TOTALS — Life Science-Related Programs*

4% S. Disagree 10% S. Agree
23% Disagree 30% In Between 33% Agree

Mean: 3.23 ± 0.10 (390) F-probability = .000

Prog.	Mean	95% Conf.	N									
LSChem	2.50	± 0.61	(10)	Psych	3.00	± 0.43	(23)	Bact	3.14	± 0.36	(28)	Genet 3.65 ± 0.50 (23)
Chem	2.70	0.42	(27)	Physio	3.04	0.47	(25)	PhySci	3.19	0.36	(36)	Botany 3.82 0.35 (22)
BioA	2.86	0.33	(29)	BioChm	3.13	0.36	(24)	BioBCD	3.29	0.39	(28)	Nutrit 3.88 0.42 (25)
SOCSCI	2.87	0.35	(39)	OthHlt	3.13	0.55	(16)	ENR	3.45	0.43	(22)	
HUMANS	2.92	0.13	(261)	Zoo	3.13	0.35	(30)	BiMdPy	3.50	0.53	(22)	

*Please see "Description of Samples," especially regarding HUMANS, SOCSCI, PhySci, OthHlt, Nutrit. Life science-related totals (and F-tests) exclude HAS and Public Health as well as HUMANS and SOCSCI.

expressing agreement (5% disagreed). There were no significant differences between program ratings, the lowest receiving a 63% agreement, the highest 84%.

Fewer students agreed that comments or review of work submitted, or on class performance, was thorough enough (43% agreed; 29% disagreed). Psychology and possibly Biology—Plan A and L & S Chemistry received ratings indicative of less effective feedback to students than was true in some other programs. Nutrition and Botany received the highest-ranked levels of agreement.

Students were clearly not willing to say that their T.A.s (or readers) were either poorly chosen or poorly-trained and supervised (71% disagreed; 8% agreed). There were only a few modest differences between program ratings, with Botany and Nutrition T.A.s receiving somewhat more approval Evidently, the horror stories about awful T.A.s are more widespread than the reality, although we apparently should have asked a question which was much less sweeping in its inditement of T.A.s (e.g., "T.A.s in this program have made a meaningful contribution to my education.").

Faculty receptivity to student input concerning course structure and content received varied ratings from program to program. Overall, 43% agreed that faculty are receptive to student input and 27% disagreed. Students in the two chemistry majors and Biology—Plan A indicated the least receptivity among their faculty. The Nutrition, Botany, and Genetics faculties seemed generally quite receptive to student input, and Bio/medical Physics and ENR also received largely favorable ratings.

Learning (Data Tables—6)

Students usually felt (62% agreed, 15% disagreed) that they would remember for a long time to come a lot of what they had learned within their own program's courses. In Biology—Plan A, however, the level of agreement and disagreement were nearly equal, and more than a few students in the two chemistry majors also expressed some reservations about the long-term value of their learning. Nutrition, with 79% agreement that long-term retention of material learned would be high, led the league in relevance.

Students in the life-related sciences agreed (58%) that they were impressed by the caliber or motivation of the other students in their major (12% disagreed). There were no significant differences between program ratings.

FACULTY

See also: "Students' Goals and the Program's Contribution Thereto," "Teaching," "Interpretation of Content," and "Competition, Workload, Grading, Testing."

T.A.s and readers in this program are either poorly chosen or poorly trained and supervised. [col. 25]

TOTALS — Life Science-Related Programs*

20% S. Disagree, 51% Disagree, 22% In Between, 3% S. Agree, 5% Agree

Mean: 2.20 ± 0.09 (412) F-probability = .033

Prog.	Mean	95% Conf.	N								
Botany	1.73	± 0.29	(26)						BiMdPy	2.48	± 0.54 (23)
Nutrit	1.81	0.29	(27)						SOCSCI	2.51	0.31 (39)
Genet	1.96	0.39	(26)	PhySci	2.24	± 0.30 (37)	HUMANS	2.41	± 0.15 (214)	Physio	2.56	0.47 (27)
							BioA	2.45	0.30 (31)		

Learning

I will remember a lot of what I have learned in the program's courses for a long time to come. [col. 50]

TOTALS — Life Science-Related Programs*

4% S. Disagree, 11% Disagree, 24% In Between, 20% S. Agree, 42% Agree

Mean: 3.62 ± 0.10 (425) F-probability = .011

Prog.	Mean	95% Conf.	N								
BioA	3.03	± 0.32	(32)	BioBCD	3.52	± 0.39 (31)	HUMANS	3.67	± 0.14 (267)	Physio	3.86	± 0.36 (29)
LSChem	3.20	0.81	(10)	OthHlt	3.53	0.52 (17)	Zoo	3.74	0.34 (31)	Botany	3.92	0.36 (26)
Chem	3.29	0.46	(28)	SOCSCI	3.55	0.31 (38)	Genet	3.81	0.40 (26)	Nutrit	4.07	0.35 (28)
BioChm	3.41	0.48	(27)	Psych	3.58	0.57 (24)	PhySci	3.82	0.33 (38)			
BiMdPy	3.43	0.47	(23)	Bact	3.63	0.27 (30)	ENR	3.84	0.44 (25)			

I have been impressed by the caliber or motivation of the other students in this major. [col. 61]

TOTALS — Life Science-Related Programs*

3% S. Disagree, 9% Disagree, 30% In Between, 19% S. Agree, 39% Agree

Mean: 3.63 ± 0.10 (414) F-probability = .388

Range: SOCSCI 3.16 ± 0.34 (38), HUMANS 3.29 ± 0.15 (263), BioA 3.32 ± 0.38 (31), BioBCD 3.32 ± 0.36 (31), to LSChem 4.00 ± 0.38 (9).

FACULTY

N.B.: See also "Students' Goals and the Program's Contribution Thereto," "Teaching," "Interpretation of Content," "Competition, Workload, Grading, Testing," etc.

Sex and Ethnicity

There are enough women faculty in this program. [col. 28]

TOTALS — Life Science-Related Programs*

27% S. Disagree, 23% Disagree, 18% In Between, 13% S. Agree, 19% Agree

Mean: 2.67 ± 0.14 (360) F-probability = .000

Prog.	Mean	95% Conf.	N								
Chem	1.63	± 0.37	(24)	BiMdPy	2.07	± 0.66 (14)**	HUMANS	2.57	± 0.17 (251)	Bact	3.58	± 0.36 (26)
BioChm	1.70	0.41	(27)	SOCSCI	2.14	0.44 (36)	Psych	2.57	0.60 (21)	Physio	3.74	0.44 (23)
PhySci	1.85	0.39	(34)	Zoo	2.29	0.44 (24)**	BioBCD	2.65	0.47 (26)	Nutrit	4.68	0.21 (28)
LSChem	1.86	0.64	(7)**	Botany	2.39	0.53 (23)	OthHlt	2.92	0.94 (13)			
ENR	2.05	0.54	(20)	BioA	2.54	0.46 (26)	Genet	3.50	0.56 (24)			

*Please see "Descriptions of Samples," especially regarding HUMANS, SOCSCI, PhySci, OthHlt, Nutrit. Life science-related totals (and F-tests) exclude HAS and Public Health as well as HUMANS and SOCSCI.

**Percentage of "No Information or Not Applicable" and blank responses is 25% or more.

Sex and Ethnicity (Data Tables—6)

Students generally did not feel that there were enough women faculty* in their programs (50% disagreed; 32% agreed). Differences between majors were immense. Students in Nutrition were more than happy with the number of women instructors (96% agreed there were enough). Students in Physiology, Bacteriology, and Genetics were generally quite satisfied too. But these programs stood head and shoulders above all others. The list of programs where more women faculty are desired includes all the others surveyed, particularly the two chemistry majors, Biochemistry, Physical Sciences, Bio/medical Physics, and ENR, with Zoology and Botany students feeling only a little less of a deficiency.

There was even stronger disagreement (58%) that there are enough ethnic minority faculty members (19% agreed). However, the level of disagreement was not significantly different from program to program, even though only one program (Physiology) got ratings reflecting more agreement than disagreement.

Informal Relations with Students (Data Tables—7)

See also: the item on student input (under "Teaching") and "Student Participation."

Students generally disagreed (48%) with the proposition that their faculty aren't really interested in or concerned about students, but a disappointingly high 21% agreed with this rather strong statement of faculty disinterest. In the two chemistry majors, more students agreed than disagreed, and Biology—Plan A got evenly split ratings. The Nutrition faculty were seen as least disinterested, and the Bio/medical Physics, ENR, Botany, and Biology—Plans BCD faculties were all rated quite favorably.

Overall, 45% of the students agreed and 26% disagreed that communication between faculty and students in their program is "open and fairly extensive." However, a large number of programs received ratings that were fairly evenly split between agreement and disagreement concerning this relatively fair expectation for faculty-student communication. Biology—Plan A had the lowest average rating (and Zoology, Physiology, Psychology and the Social Sciences, Chemistry, and Bacteriology were not far behind). Bio/medical Physics students, and the majors in the two College of Natural Resources programs rated their faculty quite favorably.

Whether at least one professor in their program knows them or their work well enough to write a good letter of recommendation was also asked of students. The item received widely varied ratings <u>within</u> the various majors, such that the fairly substantial range of mean ratings were not significantly different from one program to the next. Overall, 49% disagreed and 41% agreed that they could get at least one good recommendation. Nevertheless, Psychology, in spite of its heavy proportion of respondents who were veterans of the major, and the Biology Plans (A,BCD) apparently received the lowest levels of agreement on this item.

*"Faculty" was probably taken to include anyone who independently taught or co-taught a course, or who was not otherwise clearly identified as a T.A. or equivalent.

There are enough ethnic minority faculty in this program. [col. 29]

TOTALS — Life Science-Related Programs*

31% S. Disagree		5% S. Agree
27% Disagree	24% In Between	14% Agree

Mean: 2.37 ± 0.13 (331) F-probability = .216

Range: SOCSCI 1.94 ± 0.45 (33), Psych 2.00 ± 0.54 (21) to Physio 3.19 ± 0.73 (16)**, including HUMANS.

Informal Relations with Students

Faculty members in this program aren't really interested in or concerned about undergraduates. [col. 18]

TOTALS — Life Science-Related Programs*

14% S. Disagree		7% S. Agree
34% Disagree	31% In Between	14% Agree

Mean: 2.64 ± 0.10 (418) F-probability = .000

Prog.	Mean	95% Conf.	N										
Nutrit	1.96	± 0.36	(28)	BioBCD	2.38	± 0.37	(29)	PhySci	2.77	± 0.38	(39)	SOCSCI	3.05 ± 0.41 (39)
OthHlt	2.13	0.51	(16)	Genet	2.58	0.41	(24)	Psych	2.88	0.45	(24)	Chem	3.15 0.38 (27)
BiMdPy	2.21	0.47	(24)	HUMANS	2.71	0.13	(273)	BioChm	2.89	0.46	(28)	LSChem	3.20 0.81 (10)
ENR	2.28	0.35	(25)	Bact	2.77	0.40	(30)	Physio	2.92	0.52	(26)		
Botany	2.35	0.39	(26)	Zoo	2.77	0.36	(30)	BioA	3.03	0.36	(32)		

Communication between faculty and students in this program is open and fairly extensive. [col. 17]

TOTALS — Life Science-Related Programs*

5% S. Disagree		13% S. Agree
21% Disagree	29% In Between	32% Agree

Mean: 3.28 ± 0.10 (423) F-probability = .001

Prog.	Mean	95% Conf.	N										
BioA	2.81	± 0.42	(31)	Chem	3.00	± 0.41	(28)	Genet	3.37	± 0.38	(27)	OthHlt	3.69 ± 0.61 (16)
Zoo	2.90	0.36	(29)	Bact	3.07	0.35	(29)	BioChm	3.41	0.44	(29)	Nutrit	3.79 0.43 (28)
Physio	2.96	0.45	(28)	HUMANS	3.17	0.14	(275)	Botany	3.42	0.40	(26)	BiMdPy	3.79 0.50 (24)
SOCSCI	2.97	0.39	(38)	LSChem	3.20	0.56	(10)	PhySci	3.44	0.31	(39)		
Psych	3.00	0.48	(24)	BioBCD	3.24	0.35	(29)	ENR	3.65	0.44	(26)		

At least one professor in this program knows me or my work well enough to write me a good recommendation for graduate school or a job. [col. 19]

TOTALS — Life Science-Related Programs*

26% S. Disagree		23% S. Agree
23% Disagree	11% In Between	18% Agree

Mean: 2.87 ± 0.15 (423) F-probability = .240

Range: Psych 2.26 ± 0.64 (23), BioBCD 2.32 ± 0.50 (31), BioA 2.50 ± 0.56 (32), SOCSCI 2.74 ± 0.47 (39) . . . PhySci 2.97 ± 0.46 (39) . . . HUMANS 3.26 ± 0.17 (274), Genet 3.26 ± 0.59 (27), Botany 3.27 ± 0.65 (26), ENR 3.54 ± 0.60 (24)

I have needed further explanation or extra instruction in courses in my major, but help or a referral did not seem easy to obtain. [col. 26]

TOTALS — Life Science-Related Programs*

18% S. Disagree		6% S. Agree
44% Disagree	21% In Between	11% Agree

Mean: 2.44 ± 0.12 (345) F-probability = .138

Range: Botany 2.00 ± 0.51 (19)** to Physio 2.60 ± 0.46 (25), LSChem 3.00 ± 1.00 (8), BioA 3.08 ± 0.48 (26), including SOCSCI** and HUMANS**.

*Please see "Descriptions of Samples," especially regarding HUMANS, SOCSCI, PhySci, OthHlt, Nutrit. Life science-related totals (and F-tests) exclude HAS and Public Health as well as HUMANS and SOCSCI.

**Percentage of "No Information or Not Applicable" and blank responses is 25% or more.

Obtaining help or a referral for further explanation or extra instruction in courses was generally not a big problem for students in the various programs. Sixty-two percent (62%) disagreed that help or a referral did not seem easy to obtain, and 17% agreed. Once again, however, one would hope that it would seem easy to obtain help or (at least) a referral to help. Despite the lack of formally significant differences between programs (F-probability = .138), students in Biology—Plan A and L & S Chemistry seemed much less sure about their access to help (agreement equalled disagreement).

When it came to trusting the faculty to take student needs and views into account in program decision-making, the students in the life science-related majors were split nearly evenly between a tendency toward distrust (28%), ambivalence (35%), and tentative trust (36% — only 3% in "Strongly Agree"). The Bio/medical Physics, Nutrition, and Botany faculties were generally trusted, and students expressed the most doubts about the faculty in the two chemistry majors and in Biology—Plans BCD. Social Sciences faculty, however, were rated lower than any of the life science-related groups.

INFORMATION AND ADVISING SYSTEMS

Office staff, often the first or most regular point of contact with a department or program, were viewed rather uniformly as generally quite helpful (76% agree; 11% disagree), with the Zoology staff receiving very high ratings from Zoology majors.

Students tended to be fairly evenly divided (35% agree, 39% disagree) on whether their program provides a good general orientation for students new to the major, with little differences between the programs' ratings, except that orientation in Nutrition may have been more effective than in many other programs.

For purposes of choosing courses, professors, and understanding how best to meet their academic needs, 47% of the respondents agreed and 28% disagreed that their program's system of advising and information made it easy for them to make choices. In a number of programs, disagreement and agreement were about equal, but clear differences in mean ratings were few. However, Nutrition students expressed more satisfaction with course selection advising than students in the Biology Plans (A,BCD).

The various programs' provision of information about graduate or professional schools to which students might want to apply was rated as sufficient by 35% of the students, insufficient by 31%, and "In Between" by the remaining 34%. Given the importance of graduate training in the eyes of Berkeley faculty, one might have hoped for better performance ratings here. Formal differences between programs were borderline, but Genetics appeared to be rated lower (13% agree) than Bio/medical Physics, Biochemistry, and Physical Sciences.

I trust the faculty to take student needs and views into account in their decision-making for the program. [col. 55]
(See also "Student Participation.")

TOTALS — Life Science-Related Programs*

9% S. Disagree, 19% Disagree, 35% In Between, 33% Agree, 3% S. Agree

Mean: 3.03 ± 0.10 (413) F-probability = .006

Prog.	Mean	95% Conf.	N									
SOCSCI	2.30	± 0.37	(37)	Psych	2.78	± 0.45	(23)	Physio	3.00	± 0.40	(27)	Botany 3.48 ± 0.36 (25)
LSChem	2.63	0.89	(8)	BioA	2.81	0.41	(31)	PhySci	3.05	0.36	(38)	Nutrit 3.54 0.39 (28)
Chem	2.67	0.38	(27)	Zoo	2.81	0.35	(31)	OthHlt	3.07	0.44	(15)	BiMdPy 3.58 0.43 (24)
HUMANS	2.72	0.15	(261)	Genet	2.92	0.39	(25)	Bact	3.11	0.28	(27)	
BioBCD	2.74	0.38	(31)	ENR	2.96	0.50	(25)	BioChm	3.14	0.33	(28)	

INFORMATION AND ADVISING SYSTEMS

N.B.: See also "Informal Relations with Students."

The program's office staff are generally quite helpful. [col. 59]

TOTALS — Life Science-Related Programs*

3% S. Disagree, 8% Disagree, 14% In Between, 47% Agree, 29% S. Agree

Mean: 3.91 ± 0.10 (416) F-probability = .015

Prog.	Mean	95% Conf.	N									
LSChem	3.50	± 0.84	(10)	⋮				⋮				⋮
BioA	3.53	0.41	(32)	HUMANS	3.95	± 0.13	(269)	PhySci	4.05	± 0.28	(39)	BiMdPy 4.25 ± 0.34 (24)
SOCSCI	3.61	0.37	(38)									Zoo 4.44 0.24 (32)

The program provides a good general orientation for students new to the major. [col. 33]

TOTALS — Life Science-Related Programs*

11% S. Disagree, 28% Disagree, 25% In Between, 28% Agree, 7% S. Agree

Mean: 2.92 ± 0.11 (401) F-probability = .102

Range: OthHlt 2.56 ± 0.58 (16), BioBCD 2.64 ± 0.40 (28), Physio 2.67 ± 0.49 (27), Zoo 2.72 ± 0.45 (32), Genet 2.72 ± 0.50 (25), Bact 2.72 ± 0.38 (29) to Psych 3.39 ± 0.61 (23) and Nutrit 3.62 ± 0.41 (26), including HUMANS and SOCSCI.

The program's system of information and advising (faculty, secretaries, catalogs, etc.) makes it easy for me to choose courses, professors, and to understand how best to meet my academic needs. [col. 15]

TOTALS — Life Science-Related Programs*

7% S. Disagree, 21% Disagree, 25% In Between, 33% Agree, 14% S. Agree

Mean: 3.27 ± 0.11 (426) F-probability = .016

Prog.	Mean	95%	N									
BioA	2.81	± 0.44	(32)	Psych	3.00	± 0.47	(24)	HUMANS	3.19	± 0.14	(280)	⋮
Physio	2.86	0.54	(28)	Genet	3.00	0.51	(25)	⋮				Botany 3.60 ± 0.45 (25)
LSChem	2.90	0.53	(10)	BioBCD	3.00	0.31	(30)	PhySci	3.41	0.32	(39)	BiMdPy 3.68 0.46 (25)
SOCSCI	2.97	0.40	(39)	⋮								Nutrit 3.79 0.48 (28)

The faculty and program provide enough information about graduate and professional school programs to which I might want to apply. [col. 14]

TOTALS — Life Science-Related Programs*

7% S. Disagree, 24% Disagree, 34% In Between, 28% Agree, 7% S. Agree

Mean: 3.03 ± 0.10 (390) F-probability = .098

Range: Genet 2.52 ± 0.43 (23), BioA 2.74 ± 0.40 (31) to ENR 3.09 ± 0.53 (22), PhySci 3.32 ± 0.30 (37), OthHlt 3.33 ± 0.58 (15), BioChm 3.40 ± 0.43 (25) and BiMdPy 3.48 ± 0.47 (21), including HUMANS and SOCSCI.

*Please see "Descriptions of Samples," especially regarding HUMANS, SOCSCI, PhySci, OthHlt, Nutrit. Life science-related totals (and F-tests) exclude HAS and Public Health as well as HUMANS and SOCSCI.

Student satisfaction with their faculty/program's provision of information about career opportunities for students with a Bachelor's degree was clearly lower than for the two other types of advising (above). Fifty-four percent (54%) disagreed, overall, that they were provided with enough career-related information; 22% agreed. Only in Bacteriology and Nutrition did agreement equal or exceed disagreement. Programs rated as being less effective in providing enough career information for Bachelor's recipients included Genetics, L & S Chemistry, and Botany. In these programs, disagreement ranged from 68% to 80%, as contrasted with 37% in Bacteriology (which offers a career day for majors).

Choice of Faculty Advisors (Data Tables—9)

Students in all of the majors agreed (81%) that it would be (or is) valuable to have a regular faculty advisor of their choice; only 4% disagreed. Students' desire for a regular faculty advisor was especially strong in Psychology (78% "Strongly Agreed"), and there also tended to be more concern in Physiology and Zoology, as contrasted with Bacteriology, Physical Sciences, Genetics, and Biology—Plan A. In the programs where the need for a regular faculty advisor of choice was less important, however, agreement still ran about 75% (with "Strongly Agree" only about 21%).

Except in the Physical Sciences sample, however, students did not usually have a regular faculty advisor of their choice (72% disagreed; 19% agreed, overall). Students' views were evenly divided as to whether they had an advisor of choice in Bio/medical Physics and ENR. And agreement was low (26%), but generally above average in Nutrition (and the Social Sciences). The other eleven science-related programs had a mean rating equivalent to "Disagree" or even lower in the cases of Genetics, Bacteriology, Physiology, Psychology, Biochemistry, Chemistry, Botany, and Zoology). Evidently, most programs put forward few or no faculty for purposes of undergraduate advising, or allow little choice to undergraduates when they do so.

STUDENT PARTICIPATION

There was general agreement (72%) that the various programs should include undergraduates on most committees, provide an office, allow a quarterly mailing, etc., to facilitate undergraduate organization. Nine percent (9%) disagreed. Despite differences in students' level of trust regarding whether their program faculty will take student needs into account in their decision-making for the program (see above), there were no real differences in student support for program facilitation of student organization and input.

Although departments are expected according to the Administrative Manual to seek student advice on matters of concern to students ["Duties of Department Chairmen (or Equivalent Officers)"] and although Dean/Provost Park has for two consecutive Fall Quarters requested that L & S units call a meeting of their majors, there were very different responses from program

The faculty and program provide enough information about career opportunities for students with a Bachelor's degree in this major. [col. 13]

TOTALS — Life Science-Related Programs*

18% S. Disagree 3% S. Agree
36% Disagree 23% In Between 19% Agree

Mean: 2.53 ± 0.11 (396) F-probability = .000

Prog.	Mean	95% Conf.	N	Prog.	Mean	95% Conf.	N	Prog.	Mean	95% Conf.	N	Prog.	Mean	95% Conf.	N
Genet	1.91	± 0.37	(23)	Physio	2.28	± 0.48	(25)	BioA	2.50	± 0.40	(30)	Nutrit	3.00	± 0.41	(27)
LSChem	2.00	0.48	(10)	BiMdPy	2.30	0.51	(20)	BioBCD	2.50	0.37	(28)	Bact	3.23	0.44	(30)
Botany	2.08	0.39	(25)	ENR	2.48	0.52	(23)	PhySci	2.56	0.39	(36)	OthHlt	3.27	0.44	(15)
HUMANS	2.18	0.15	(233)	BioChm	2.48	0.40	(27)	Chem	2.64	0.43	(25)				
Zoo	2.24	0.36	(29)	SOCSCI	2.49	0.37	(37)	Psych	2.74	0.51	(23)				

Choice of Faculty Advisors

Students have a regular faculty advisor of their choice in this program. [col. 16]

TOTALS — Life Science-Related Programs*

41% S. Disagree 8% S. Agree
31% Disagree 9% In Between 11% Agree

Mean: 2.15 ± 0.13 (405) F-probability = .000

Prog.	Mean	95% Conf.	N	Prog.	Mean	95% Conf.	N	Prog.	Mean	95% Conf.	N	Prog.	Mean	95% Conf.	N
Genet	1.40	± 0.24	(25)	Chem	1.75	± 0.34	(24)	BioBCD	2.06	± 0.47	(31)	BiMdPy	3.04	± 0.48	(23)
Bact	1.55	0.31	(31)	Botany	1.81	0.43	(26)	LSChem	2.11	0.71	(9)	ENR	3.04	0.71	(23)
Physio	1.61	0.32	(28)	Zoo	1.83	0.43	(30)	SOCSCI	2.49	0.50	(35)	PhySci	3.53	0.47	(36)
Psych	1.73	0.57	(22)	HUMANS	1.96	0.15	(253)	Nutrit	2.52	0.54	(27)				
BioChm	1.73	0.35	(26)	BioA	1.96	0.43	(28)	OthHlt	2.75	0.66	(16)				

It would be (is) valuable to have a regular faculty advisor of my choice. [col. 60]

TOTALS — Life Science-Related Programs*

1% S. Disagree 40% S. Agree
3% Disagree 14% In Between 41% Agree

Mean: 4.16 ± 0.08 (411) F-probability = .002

Prog.	Mean	95% Conf.	N	Prog.	Mean	95% Conf.	N	Prog.	Mean	95% Conf.	N	Prog.	Mean	95% Conf.	N
Bact	3.77	± 0.28	(31)	SOCSCI	4.06	± 0.30	(36)	⋮				Zoo	4.44	± 0.29	(32)
PhySci	3.86	0.37	(36)	Chem	4.07	0.36	(27)	HUMANS	4.33	± 0.09	(263)	Physio	4.50	0.27	(28)
Genet	3.87	0.48	(23)	Botany	4.08	0.30	(24)	⋮				Psych	4.70	0.30	(23)
BioA	3.94	0.32	(32)					⋮							

STUDENT PARTICIPATION

The program should include undergraduates on most committees, provide an office, allow a quarterly mailing, etc., to facilitate undergraduate organization. [col. 53]

TOTALS — Life Science-Related Programs*

2% S. Disagree 24% S. Agree
7% Disagree 19% In Between 48% Agree

Mean: 3.84 ± 0.10 (377) F-probability = .486

Range: BioChm 3.48 ± 0.45 (23) to Nutrit 4.13 ± 0.40 (23), including HUMANS and SOCSCI.

I have never been notified of a meeting of a general undergraduate organization in this program. [col. 51]

TOTALS — Life Science-Related Programs*

20% S. Disagree 24% S. Agree
26% Disagree 8% In Between 22% Agree

Mean: 3.05 ± 0.15 (411) F-probability = .000

Prog.	Mean	95% Conf.	N	Prog.	Mean	95% Conf.	N	Prog.	Mean	95% Conf.	N	Prog.	Mean	95% Conf.	N
BiMdPy	1.61	± 0.39	(23)	HUMANS	2.64	± 0.13	(260)	BioA	3.19	± 0.51	(32)	BioChm	4.21	± 0.37	(24)
Psych	1.71	0.44	(24)	BioBCD	2.65	0.46	(31)	LSChem	3.33	0.86	(9)	Physio	4.42	0.36	(26)
Nutrit	2.21	0.51	(28)	Zoo	2.66	0.54	(32)	Chem	3.48	0.54	(27)	Genet	4.48	0.34	(23)
PhySci	2.24	0.42	(38)	OthHlt	2.69	0.69	(16)	Bact	3.71	0.54	(31)				
SOCSCI	2.36	0.48	(39)	Botany	2.80	0.56	(25)	ENR	4.05	0.57	(22)				

*Please see "Descriptions of Samples," especially regarding HUMANS, SOCSCI, PhySci, OthHlt, Nutrit. Life science-related totals (and F-tests) exclude HAS and Public Health as well as HUMANS and SOCSCI.

to program about whether the students had ever been notified of a general meeting of undergraduates in their program. Overall, 46% of the students agreed they had been notified of at least one such meeting, and 46% disagreed. Bio/medical Physics and Psychology were the best models in this regard, and Nutrition and the Physical and Social Sciences did fairly well. On the other hand, students in Genetics, Physiology, Biochemistry, ENR, Bacteriology, and the two chemistry majors indicated the absence or least effective notification of an undergraduate meeting.

A question about whether the respondents had been active in a departmental organization, served on a department committee, attended a faculty meeting, or otherwise been directly consulted to provide student input drew an 8% agreement and an 85% disagreement. The same percentage of students disagreed and even fewer agreed (5%) that they knew a lot about decision-making processes, policies and governance in their program. The lowest amounts of activity by or consultation with students, and of student knowledge about their program's decision-making processes, were in Genetics, Physiology, Bacteriology, and Biology—Plan A (with Biology—Plans BCD not far ahead). Chemistry students also reported a low activity/consultation level, and Botany students indicated little knowledge about program decision-making. The most active or consulted students were in Nutrition and Bio/medical Physics. The most knowledgeable (10% agree) seemed to be in Biochemistry and Bio/medical Physics.

Teaching Evaluation (Data Tables—10)

Students in all the programs reported (92% agreed) that teaching evaluation forms were distributed in each of the program's classes in which they were enrolled. Large percentages in all the programs also agreed (79%) that all faculty should occasionally use the Primer teaching evaluation questionnaire to evaluate their larger courses and those required for the major, so that students will have access to evaluations of faculty teaching. Only 7% disagreed. Agreement ranged from 64% to 90% across the programs, and there were no significant differences between the programs' students in their acceptance of Primer.

OVERALL SATISFACTION

To summarize their evaluations of many components of their education at Berkeley, students were asked for ratings of their "overall level of satisfaction with your major program (faculty, teaching, advising, courses/curriculum, governance, etc.)." Sixty-four percent (64%) of the students rated their satisfaction on the high side of a 7-point scale ("moderately high," "high," "extremely high"). However, only 5% chose "extremely high." The modal response for the whole scale was "moderately high" (34%). Only 17% rated their overall satisfaction level as low, the bulk of them (10%) choosing "moderately low." Almost a fifth (19%) marked "in between." Obviously, these are in-process ratings in most cases.

I have been an active member of a student organization, served on a departmental committee, attended a faculty meeting, or have been directly consulted to provide student input to this program. [col. 52]

TOTALS — Life Science-Related Programs*

48% S. Disagree, 37% Disagree, 7% In Between, 4% Agree, 4% S. Agree

Mean: 1.79 ± 0.10 (390) F-probability = .000

Prog.	Mean	95% Conf.	N	Prog.	Mean	95% Conf.	N	Prog.	Mean	95% Conf.	N	Prog.	Mean	95% Conf.	N
Genet	1.27	± 0.18	(26)	BioBCD	1.64	± 0.28	(28)	BioChm	1.92	± 0.52	(25)	BiMdPy	2.23	± 0.45	(22)
Physio	1.28	0.28	(25)	Botany	1.80	0.40	(25)	PhySci	1.94	0.36	(36)	OthHlt	2.31	0.67	(13)
Bact	1.43	0.20	(28)	SOCSCI	1.82	0.34	(38)	Zoo	2.04	0.51	(29)	Nutrit	2.42	0.58	(24)
BioA	1.47	0.21	(30)	LSChem	1.89	0.60	(9)	ENR	2.04	0.50	(23)				
Chem	1.58	0.41	(26)	Psych	1.90	0.52	(21)	HUMANS	2.05	0.15	(237)				

I know a lot about the decision-making processes, policies, and governance in the program. [col. 54]

TOTALS — Life Science-Related Programs*

47% S. Disagree, 38% Disagree, 10% In Between, 3% Agree, 2% S. Agree

Mean: 1.75 ± 0.09 (406) F-probability = .000

Prog.	Mean	95% Conf.	N	Prog.	Mean	95% Conf.	N	Prog.	Mean	95% Conf.	N	Prog.	Mean	95% Conf.	N
Physio	1.26	± 0.24	(27)	BioBCD	1.70	± 0.31	(30)	Chem	1.85	± 0.34	(27)	BiMdPy	2.09	± 0.45	(22)
Genet	1.35	0.23	(26)	SOCSCI	1.74	0.30	(35)	PhySci	1.92	0.34	(37)	OthHlt	2.14	0.55	(14)
Botany	1.38	0.24	(24)	LSChem	1.75	0.59	(8)	ENR	1.96	0.46	(24)	BioChm	2.15	0.47	(27)
Bact	1.45	0.21	(31)	HUMANS	1.81	0.11	(254)	Zoo	1.97	0.33	(31)				
BioA	1.50	0.22	(32)	Psych	1.82	0.51	(22)	Nutrit	2.00	0.35	(24)				

N.B.: See also, "I trust the faculty to take student needs and views into account in their decision-making for the program," the last item in the tables concerning "Informal Relations with Students."

Teaching Evaluation

At least one form for student evaluation of teaching was distributed last quarter in each of the program's courses in which I was enrolled. [col. 56]

TOTALS — Life Science-Related Programs*

2% S. Disagree, 4% Disagree, 1% In Between, 40% S. Agree, 52% Agree

Mean: 4.23 (420) — No F-test requested

All faculty should occasionally use the ASUC Primer questionnaire to evaluate their larger courses and those required for the major, so that students will have access to evaluations of faculty teaching. [col. 57]

TOTALS — Life Science-Related Programs*

4% S. Disagree, 3% Disagree, 15% In Between, 32% S. Agree, 47% Agree

Mean: 3.99 ± 0.09 (409) F-probability = .650

Range: BiMdPy 3.50 ± 0.53 (22) to Psych 4.21 ± 0.39 (24), including HUMANS and SOCSCI.

OVERALL SATISFACTION

N.B.: See also "I will remember a lot of what I have learned in the program's courses for a long time to come" (under Teaching/Learning).

Please rate your overall level of satisfaction with your major program (faculty, teaching, advising, courses/curriculum, governance, etc.). [col. 74] [Note 7-point scale.]

TOTALS — Life Science-Related Programs*

1% Extremely Low, 6% Low, 10% Moderately Low, 19% In Between, 34% Moderately High, 25% High, 5% Extremely High

Mean: 4.74 ± 0.13 (420) F-probability = .002

Prog.	Mean	95% Conf.	N	Prog.	Mean	95% Conf.	N	Prog.	Mean	95% Conf.	N	Prog.	Mean	95% Conf.	N
LSChem	3.70	± 0.90	(10)	Genet	4.56	± 0.52	(25)	Bact	4.82	± 0.35	(28)	ENR	5.04	± 0.49	(26)
BioA	4.06	0.46	(32)	SOCSCI	4.60	0.42	(40)	PhySci	4.95	0.32	(38)	Botany	5.08	0.53	(26)
Psych	4.17	0.70	(24)	Chem	4.74	0.56	(27)	BiMdPy	4.96	0.57	(25)	Nutrit	5.25	0.51	(28)
BioBCD	4.27	0.52	(30)	Zoo	4.81	0.41	(31)	OthHlt	5.00	0.55	(15)				
HUMANS	4.48	0.18	(272)	Physio	4.81	0.52	(27)	BioChm	5.04	0.55	(28)				

*Please see "Descriptions of Samples," especially regarding HUMANS, SOCSCI, PhySci, OthHlt, Nutrit. Life science-related totals (and F-tests) exclude HAS and Public Health as well as HUMANS and SOCSCI.

Across the programs, the average overall satisfaction rating ranged from the equivalent of a little below "in between" to a little above "moderately high." Students in L & S Chemistry, the Biology Plans (A,BCD), and Psychology seemed least satisfied. Although a good number of programs had mean ratings right near the "moderately high" mark, students in Nutrition may have been a little more satisfied than most.

See also: the item "I will remember a lot of what I have learned in the program's courses for a long time to come" (under Teaching/Learning).

STUDENTS' GOALS AND THE PROGRAM'S CONTRIBUTION THERETO

We also sought more information about student satisfaction by asking about the importance to students of five typical goals of a college or university education and the extent to which these goals were met by their program ("program contribution").

Across the life science-related programs, the goals of acquiring training in critical thinking and analysis (hereafter "critical thinking"), preparation for a career, and preparation for graduate or professional school received very slightly higher ratings of importance to students than did acquiring a broad, general, humanistic, or person-centered education (hereafter, a "broadly humanistic education") and promoting social responsibility or developing skills useful in the community (hereafter, "social responsibility/community skills"). The average "importance" ratings were at or above the response category "high" on a 5-point scale (very high — high — in between — low — very low).

The importance of these goals to students in the various programs were largely the same for two of the five, but career preparation was perhaps most important to students in Nutrition and Bacteriology. Social responsibility/community skills were also most important in Nutrition, perhaps second-most important among Psychology students, and lower in Physical Sciences and Chemistry. Broadly humanistic goals seemed somewhat more important in Psychology and Nutrition than in some other programs.

Difference Scores (Data Tables—11)

In the table presenting the results of the students' ratings of importance of the five educational goals, we have also presented averages for the ratings of program contribution as well as a "difference score" between the two. Larger difference scores presumably suggest which areas of effort by a program might most result in improvements in undergraduate education in that program. While there are significant differences in the ratings of program contribution for all five of these student goals, the discussion following will also focus on the difference scores.*

*Unfortunately, time constraints prevented us from undertaking a closer statistical analysis of the difference in ratings. (Since most respondents rated both the importance and contribution measures, it was not particularly necessary to discount students who answered only the importance component of the pair.)

STUDENTS' GOALS AND THE PROGRAM'S CONTRIBUTION THERETO

Importance of Goals to Students, Program Contribution to Meeting Goals, Difference Scores*

Program	Prep for a Career			Preparation for Grad/Prof School			Broad Humanistic			Critical Thinking			Social Responsib			Five-Item Average N	
	Impt	Dept Met	Diff	Impt	Dept Met	Diff	Impt	Dept Met	Diff	Impt	Dept Met	Diff	Impt	Dept Met	Diff	Impt	Dept Met
Bact	4.58	3.77	.81	4.22	3.90	.32	3.65	2.62	1.03	4.22	3.94	.28	3.97	3.03	.94	31.2	30.2
BioChm	4.38	3.31	1.07	4.48	3.59	.89	4.07	2.68	1.39	4.48	3.71	.77	4.00	2.24	1.76	28.6	27.2
BioA	4.34	2.90	1.44	4.50	3.28	1.22	3.97	2.61	1.36	4.09	3.22	.87	4.16	2.10	2.06	31.6	30.4
BioBCD	3.93	2.59	1.34	3.97	3.47	.50	3.97	2.93	1.04	4.16	3.40	.76	3.75	2.60	1.15	29.8	28.2
ENR	4.23	3.14	1.09	4.08	3.83	.25	3.84	2.79	1.05	4.42	3.38	1.04	4.17	2.91	1.26	25.2	23.0
BiMdPy	4.00	3.52	.48	4.16	4.08	.08	3.88	2.68	1.20	4.36	3.80	.56	3.68	2.64	1.04	24.4	23.8
Botany	4.04	2.80	1.24	4.04	3.88	.16	3.67	2.92	.75	4.12	3.23	.89	3.64	2.18	1.46	24.8	24.2
Chem	4.04	3.04	1.00	4.19	3.59	.60	3.67	2.33	1.34	4.22	3.44	.78	3.52	2.22	1.30	26.8	26.0
LSChem	3.90	3.00	.90	3.70	3.40	.30	4.30	2.00	2.30	4.40	3.40	1.00	3.78	2.00	1.78	9.8	9.8
Genet	4.23	2.91	1.32	4.11	3.52	.59	4.08	2.65	1.43	4.44	3.89	.55	4.00	3.08	.92	26.2	24.8
Nutrit	4.74	3.63	1.11	4.00	3.55	.45	4.42	3.44	.98	4.39	3.65	.74	4.54	3.54	1.00	26.8	25.2
PhySci	3.95	3.00	.95	3.97	4.00	-.03	3.76	2.29	1.47	4.34	4.11	.23	3.45	2.04	1.41	36.4	33.6
Physio	4.44	3.21	1.23	4.54	3.68	.86	4.15	2.76	1.39	4.45	3.29	1.16	4.15	2.61	1.54	27.2	25.6
Psych	4.42	2.21	2.21	4.08	2.87	1.21	4.46	2.92	1.54	4.33	3.88	.44	4.29	2.59	1.70	24.0	23.4
Zoo	4.13	2.81	1.32	4.13	3.16	.97	3.97	3.03	.94	3.88	3.29	.59	3.77	2.63	1.14	31.2	31.0
OthHlt	4.25	3.38	.87	4.14	3.83	.31	3.88	2.94	.94	4.19	3.56	.63	4.00	2.79	1.21	15.4	14.8
SUBTOTALS	4.23	3.08	1.15	4.16	3.61	.55	3.96	2.74	1.22	4.27	3.59	.68	3.93	2.59	1.34		
F-prob	.016	.000		.356	.000		.021	.002		.117	.001		.002	.000			
5= V High	49%	10%		47%	18%		32%	4%		44%	18%		33%	6%			
4= High	31%	28%		32%	42%		40%	19%		42%	39%		38%	13%			
3= In Bet	15%	31%		14%	26%		21%	37%		13%	30%		18%	33%			
2= Low	4%	22%		4%	11%		5%	28%		2%	11%		9%	30%			
1= V Low	1%	9%		3%	3%		1%	12%		0%	2%		2%	18%			
HUMANS	3.83	2.44	1.39	3.71	3.25	.46	4.36	3.33	1.03	4.38	3.58	.80	3.81	2.22	1.59		
SOCSCI	4.07	3.05	1.02	4.00	3.33	.67	4.27	3.54	.73	4.54	3.93	.61	4.22	3.22	1.00		

*The original questionnaire item was worded as follows: "To what extent are the following goals important to you, and to what extent has your major program met them?" The students were then asked to rate "Importance to you" and "Program's contribution" for each of the following five goals:

1) Preparation for a career
2) Preparation for graduate or professional school
3) Providing a broad, general, humanistic, or person-centered education
4) Providing training in critical thinking and analysis
5) Promoting social responsibility or developing skills useful in the community.

Please note that the "difference scores" are based on students who responded to either or both the "Importance to you" and "Program's contribution" ratings. However, as indicated in the two righthand columns of the table, there are only a few students who did not rate both components of each item. The average nonresponse rate for the five assessments of "Program's contribution" are: PhySci (16.0%), Physio (14.7%), OthHlt (12.9%), ENR (11.5%), Nutrit (10.0%), BioChm (9.3%), BioBCD (9.0%), Genet (8.1%), Chem (7.1%), Botany (6.9%), Bact (5.6%), BioA (5.0%), BiMdPy (4.8%), Zoo (3.1%), Psych (2.5%), and LSChem (2.0%).

In this case, the average difference scores (subtotals) are means of program means rather than of the sum of individual differences.

The largest average deficiencies ("difference scores") and the lowest program contribution ratings were perceived to be in the areas of social responsibility/community skills, a broadly humanistic education, and career preparation. Nineteen percent (19%) viewed program contributions to social responsibility/community skills as high (48% viewed them as low); 23% saw the broadly humanistic contribution of their program as high, 40% as low; and 38% thought career preparation contributions were high while 31% viewed them as low.* Thus all but a very few of the programs sampled could presumably benefit by increasing their efforts to meet students' educational goals in these three areas.

With regard to social responsibility/community skills, programs with the largest differentials between students' importance and contribution ratings were the Biology Plans (A,BCD), L & S Chemistry, and Psychology (with its relatively high importance rating). None of the differentials were really small, but among the lower ones were those for Genetics, Bacteriology, Nutrition, and Bio/medical Physics. Nutrition had a relatively low differential despite the high(est) importance ratings given by that program's students.

In career preparation, the Psychology Department was rated as especially low by its majors, and the deficiency seemed quite large even in comparison to the other Social Sciences. Majors in the Biology Plans (A,BCD) also seemed to feel that career preparation was weak in the program, and the difference was large in comparison to the students' importance ratings. Program contributions to career preparation were seen as strongest in Bacteriology, Nutrition, and Bio/medical Physics. And the difference scores were lowest for Bio/medical Physics and Bacteriology (in the latter case, in spite of the high importance of career preparation to the majors). Majors in Physical Sciences and the two chemistry programs tended to be less dissatisfied (differentially) with career preparation too, apparently due mostly to a more modest importance assigned career preparation by those majors.

L & S Chemistry majors, who rated a broadly humanistic education as fairly important, rated their program fairly low (and generated a very large difference score in the process). Program contributions to a broadly humanistic education in Chemistry and Physical Sciences were also rated as low. Botany students seemed to be the least dissatisfied (differentially) with the level of humanistic education in their program. The Nutrition program received good ratings for its contribution to a broadly humanistic education, but these goals were quite important to its students (so the difference was only moderately low).

The programs sampled were rated as more successful in providing training in critical thinking and analysis, and in preparing students for graduate or professional school. Well over half (57-60%) saw program contributions in these areas as high, and only 13-14% rated them as low. As the relative weaknesses are reported below then, it should be borne in mind that the magnitude of even the largest perceived deficiencies in these two goal areas is such that it would represent only an average difference score on the three dimensions reported above.

*In this text, "very high" plus "high" on the original scale are combined to "high," and "very low" plus "low" are combined to "low."

With that caveat in mind, it is fair to report that differences between the importance and contribution ratings on "critical thinking" were highest in Physiology, ENR, and L & S Chemistry. (In each case, importance ratings were a little high and contribution ratings a little low.) The average ratings of program contribution were relatively low in Biology—Plan A, Botany, and Zoology. Differential satisfaction appeared to be greatest in Physical Sciences, where the contribution rating was particularly high, and in Bacteriology. Program contributions to critical thinking were also rated a little above the overall average in Psychology and Genetics.

Using the difference scores, sufficient preparation for graduate or professional school seemed to be lacking most in Biology—Plan A, and Psychology, as well as in Zoology, Biochemistry, and Physiology. The program's contributions were rated low in Psychology and, to a lesser extent, in Zoology, and Biology—Plan A. (Student ratings of the importance of preparation for graduate or professional school were nominally highest in Biochemistry, Physiology, and Biology—Plan A.) Preparation for graduate or professional school was seen as least deficient (or evenly entirely adequate) in Physical Sciences, Bio/medical Physics, and Botany.

Summary of Program Contributions

Considering each of the five goals as equal in value, and averaging the difference scores between the "importance" and "program contribution" ratings, one gets the picture that dissatisfaction is highest in Psychology and Biology—Plan A, and fairly high as well in L & S Chemistry, Physiology, and Biochemistry. (Three of these majors have the largest concentrations of pre-medical school students in this sample.) These results are fairly close to those obtained in the responses to the question about students' overall satisfaction.